COTTON

JUNE, 1913

BALDWIN & LESLIE

Dry Goods Commission Merchants

61 Leonard St., - - - - - - New York

SELLING AGENTS FOR

Parker Cotton Mills Company, - - - Greenville, S. C.

LEWIS W. PARKER, Pres.

Consisting of the following Mills:

OLYMPIA COTTON MILLS
RICHLAND COTTON MILLS
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APALACHE MILLS
VICTOR MFG. CO.
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CAPITOL CITY MILLS

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REPUBLIC COTTON MILLS
MARION MFG. CO.
PANOLA COTTON MILLS
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FRISBEE MFG. CO.
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Alphabetical and Classified Index to Advertisements Following Reading Pages

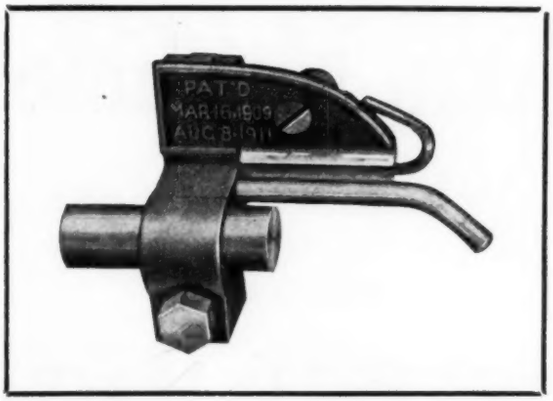
DUTCHER TEMPLES

Trade Mark Reg. U. S. Pat. Off.

DRAPER COMPANY

SOLE MANUFACTURERS

HOPEDALE :: :: MASS.



The MacColl Patent Spooler Guide

will, with a much more open setting, remove slubs or bunches that would pass through other spooler guides;

it will allow small piecings and knots which are unobjectionable to pass through;

it will pluck loose slubs and imperfections from the yarn without breaking, holding the slubs, etc., in the teeth until they are cleaned;

it is easily set, cleaned and adjusted;

as it works with a larger opening it requires less frequent adjusting than other guides.

On worsted yarns the production in after processes is greatly increased, as the yarn is delivered practically free from slubs and it is unnecessary to stop continually to remove these imperfections.

DRAPER COMPANY

HOPEDALE, MASS.

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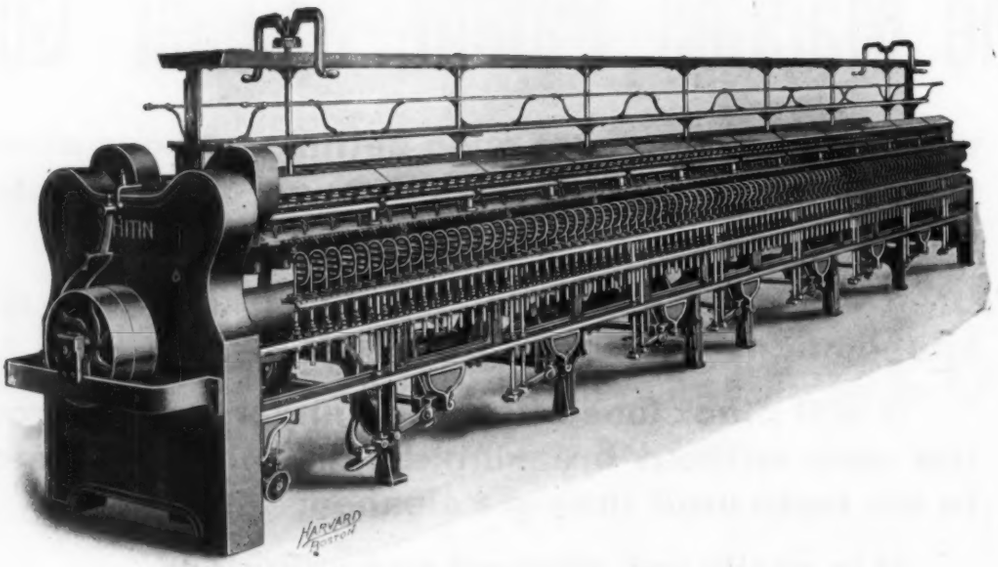
The Whitin Machine Works

Whitinsville, Mass.

BUILDERS OF

COTTON MILL MACHINERY



Ring Spinning Frame

Manufacturers of Carding, Spinning and Weaving Machinery for Cotton Mills.

Southern Agent—STUART W. CRAMER,

Charlotte, N. C.

MASON MACHINE WORKS

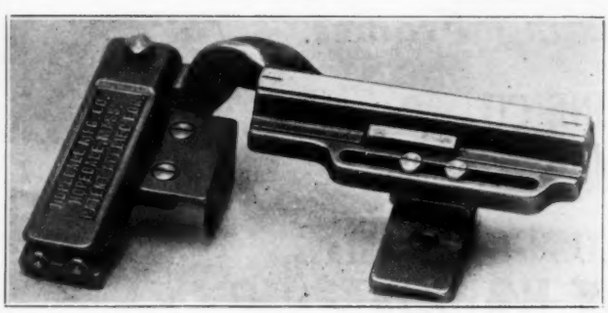
SUPERIOR

LOOM CRANKS

FOR REPAIRS OF
LOOMS OF OTHER
SHOPS

CARDS DRAWING SPINNING LOOMS MULES

TAUNTON MASS. CHARLOTTE N. C.



We Announce

that we are now prepared to accept orders for

Improved Temples, Temple Rolls, Drop Wires and a New Warp Stop Motion

When you are in the market for any of the above it will pay you to communicate with us.

Hopedale Manufacturing Co.
HOPEDALE. MASS.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT

JOS. T. PEARSON 1815-25 E. BOSTON AVE. KENSINGTON PHILA.

A. G. THURSTON & SON

R. W. THURSTON, Proprietor

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers and General Machinery

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls

Speeder Flyers repaired and fitted with any style presser.

Spindles Straightened, Restepped and Retopped.

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By

Specialists.

POTTER & JOHNSTON MACHINE CO., Pawtucket, R. I.
Pickers and Revolving Flat Cards.

WOONSOCKET MACHINE & PRESS CO., Woonsocket, R. I.
Drawing and Roving Frames.

FALES & JENKS MACHINE CO., Pawtucket, R. I.
Spinning and Twisting Frames.

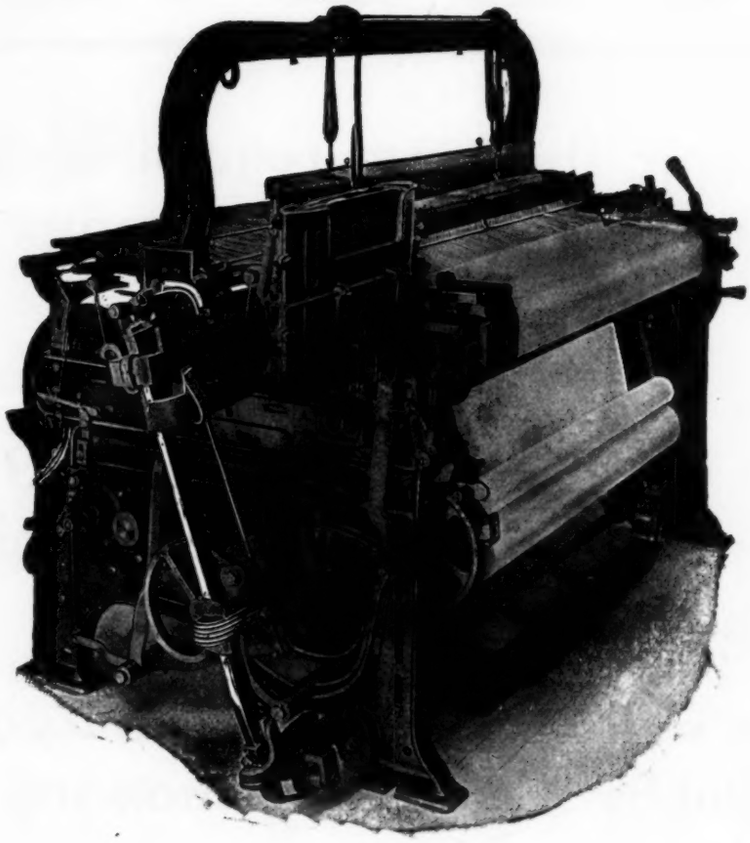
EASTON & BURNHAM MACHINE CO., Pawtucket, R. I.
Spoolers and Reels.

T. C. ENTWISTLE CO., Lowell, Mass.
Beamers and Warpers

JOHN HETHERINGTON & SONS
Nasmith Combers

J. H. MAYES, Southern Agent
1112 Independence Building, Charlotte, North Carolina.

"IDEAL" AUTOMATIC LOOM



No other loom can equal it in production, quality of cloth, freedom from breakages and repairs and ability to use cop or bobbin filling.

THE STAFFORD COMPANY

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FRED H. WHITE, Southern Agent, CHARLOTTE, N. C.

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One of the first requisites in the make up of a good loom weaving fancy fabrics is a good Dobby.

The Crompton & Knowles Loom Works build a complete line of Dobbies accepted everywhere as the standard of excellence.

We will be pleased to send you our new Dobby Catalogue, showing some of the types we make.

Looms for Every Known Fabric

Crompton & Knowles Loom Works

WORCESTER, MASS.

PROVIDENCE, R. I. PHILADELPHIA, PA.

WHITIN RINGS.

LIGHTEST RUNNING
MOST DURABLE, and
MOST ECONOMICAL.

Have you seen our
1910 Diamond Finish

WHITINSVILLE SPINNING RING CO. Whitinsville, Mass. U.S.A.

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Near 50th St. Subway Station and 53d St. Elevated

"Broadway" Cars from Grand Central Depot pass the door
Also 7th Avenue Cars from Pennsylvania Station

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Best Hotel Accommodations in New York at Reasonable Rates
$2.50 WITH BATH, AND UP
Suites $4.00, and Up
All Hardwood Floors and Oriental Rugs
Ten minutes' walk to 30 Theatres

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HAYRRY P. STIMSON, Formerly with Hotel Imperial

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SPECIAL SUMMER RATES FOR SOUTHERN PEOPLE

A Lace and Edging Machine That Runs Quietly at High Speed

Also adapted to manufacture of fancy knit goods, coats, sweaters, shawls, nubias, golf vests and their trimmings.

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KILBURN, LINCOLN & CO.

Makers of Looms for

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Southern Agent, O. A. Robbins, - - Charlotte, N. C.

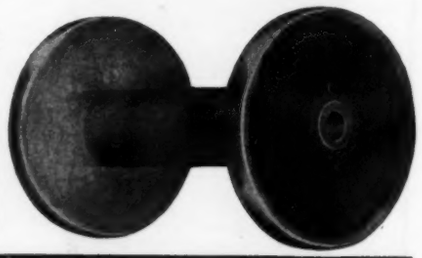
STEWART & SONS

MANUFACTURERS

LOOM REEDS

Jasper and Orleans Sts. PHILADELPHIA, PA

You say your loss from broken spools is but a mere trifle



Did you ever attempt to prove that statement? Do it, for your own satisfaction. The magnitude of this waste is not readily apparent in the stress of other matters, but if you will apply yourself to the matter you'll see it is a big item on the wrong side of your ledger. Our METAL PROTECTED SPOOLS will save practically all this loss for you. They rarely ever break or separate. When you consider that it's the full spool which breaks, you'll see why our METAL PROTECTED Spools save you big money. The metal does not rust or stain the yarn. It protects both the outside and inside of spool. We are making a special trial offer to mills who have never used our spool. Write for this offer and sample spools at once. ADDRESS ☞

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Reels for Cotton

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Patented Hosiery Winders, Cop Winders and Spoolers

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Dary Ring Traveler Co.

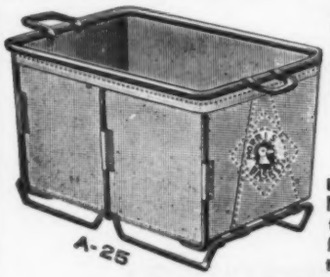
MANUFACTURERS OF

HIGH GRADE

Spinning and Twisting Travelers

Taunton, Massachusetts

THIS IS TO KEEP YOU INFORMED OF OUR ADDRESS



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All sizes and shapes. For all purposes.

Our registered Trade Mark distinguishes from imitations.

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MAKER OF

Fulling Machines, Washing Machines, Drying Form Boards

OF EVERY VARIETY

For Ladies', Men's and Children's Goods

SACO-LOWELL SHOPS

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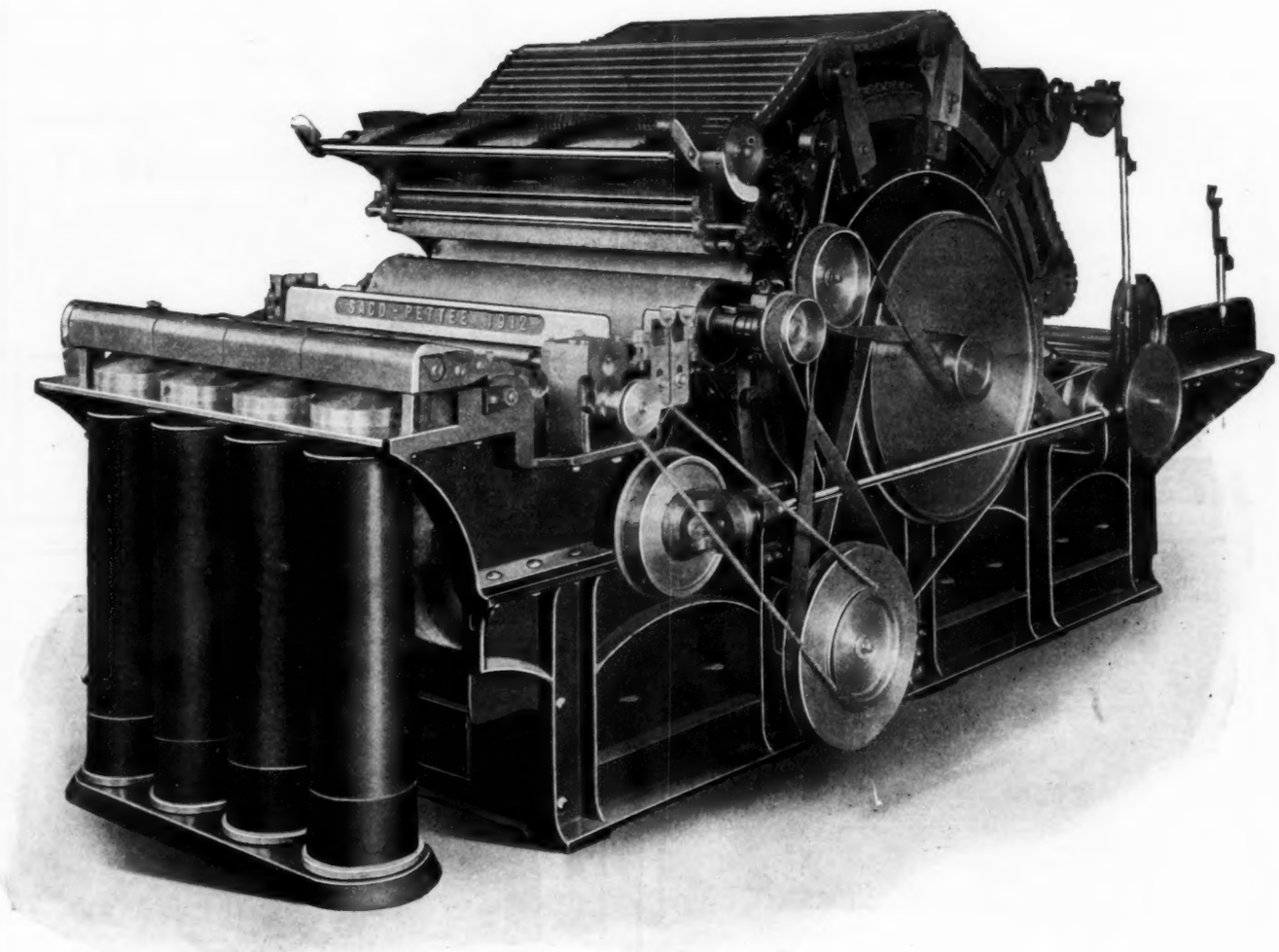

4-COILER WASTE CARD

COMPLETE WASTE REWORKING PLANTS

ROGERS W. DAVIS Southern Agent CHARLOTTE, N. C.

IN BUYING BRUSHES

You want to get the best that your money will buy.

That Means Felton's Brushes

Mill brushes of all kinds—High in quality—Low in price.

Send for the book "Felton's Mill Brushes."

S. A. Felton & Son Co.
Manchester, N. H.

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TRY A BARREL FOR 60 DAYS

If it does not come up to your standard of what a good lubricating oil should be, and you consider that it is not worth our price—put your own value on it and remit on that basis. Isn't that a fair proposition? "A. C. C." will pare down your oil and cylinder repair bills—save your piston packing, too. It has been doing this for forty years, it will effect such a saving now — just give "A. C. C." a chance.

May we go into the subject with you?

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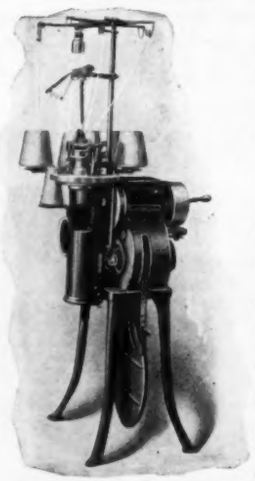
A New System of Machinery For Producing Seamless Hosiery

Scott & Williams Model B

(INCORPORATED)

Replacing Former Model B



Five Yarn Changes.

Sectional slackening prior to the heavy yarn changes, thereby preventing cutting and waste.

Fabric also slackened where high splicing yarn is inserted, thus insuring narrow ankle and foot.

For transfer work less moves than any other machine on the market.

Scott & Williams
(Incorporated)
Model F

The most comprehensive machine ever offered to the trade.

Makes women's hose with integral welt—no sewing necessary.

Or will make women's hose with selvage top, using any kind of yarn from silk to carded cotton.

Makes half-hose without a transfer.

All dropped from the machine—looping alone required.

Anti-run-back course preventing ravelling from garter tears and other causes.

This machine may also be used for making string work, or half hose transferred in the old fashioned way.

Scott & Williams, Inc., 88 Pearl St., Boston, Mass.

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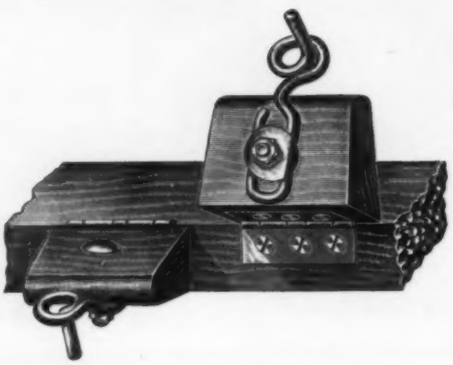

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Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

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FANS ALL SIZES. 18 inches in diameter up to 240 inches for ALL KINDS of HARD WORK.

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Steam Fans
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Steam Turbine Fans

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TELL ME YOUR REQUIREMENTS AND I WILL MAKE YOU A LOW PRICE ON A FAN THAT WILL DO YOUR WORK.

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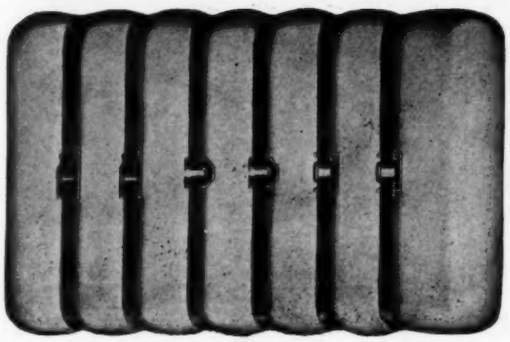
51-53 Lawrence Street,
Newark, New Jersey.



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Acme Steel Goods Co.

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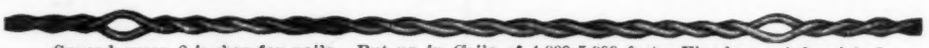
Box Strapping
Corner Irons
Case Seals
Acme Galvanized
Twisted Wire

ACME
ESTABLISHED 1880



Spread every 6 inches for nails. Put up in Coils of 4,000-5,000 feet. Wooden reel furnished.

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Our Patent Hand Threading Shuttle containing Shambow-Marble Spindle which we consider the finest spindle made. It stays level longest and is easiest on your bobbins. We have a special Marble Spindle Catch for ringed Bobbins.

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A Worth While Hand Threader

in the Best Shuttle Made.

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WARP TYING MACHINES
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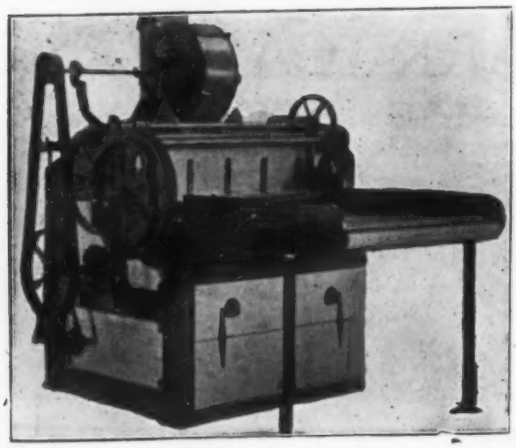

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For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, etc.

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A simple, inexpensive machine for Attaching Tickets on Hosiery Underwear, etc.

Uses a pointed staple. Cannot injure the finest Silk Hose. Is portable. Can be set aside when not in use. Is operated by foot power and has a patented WORK-HOLDING DEVICE, carrying one dozen or more pairs of Hose, keeping them in perfect alignment and presenting the tops in position to receive the tickets at least twenty-five per cent quicker than by any other method now in use.

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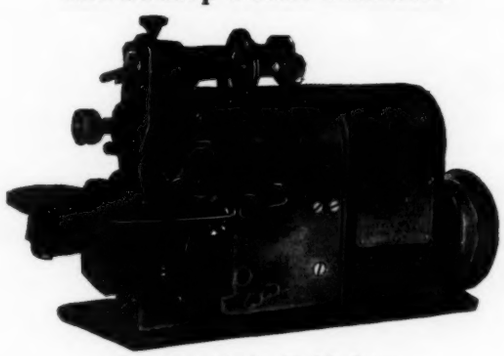
THE MERROW

High Speed Overseaming, Overedging and Scallop Stitch Machines



Our New Style 60 Machine

For Trimming and Overseaming in one operation produces the strongest seam with the greatest economy.

USE STYLE 60S for welting Stockings, blind stitch.
USE STYLE 60H for hemming bottoms of Underwear.
USE STYLE 17 or 22 for Bed Blankets.
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Under wear, Sweaters, Cuffs with Cut Welt, Selvage, or French Welt, Mantles, Collarettes, Toques, Golf Caps, Hosiery Tops, Skirts, Borders, Corset Covers, Button Stays, Mittens, Bandages.

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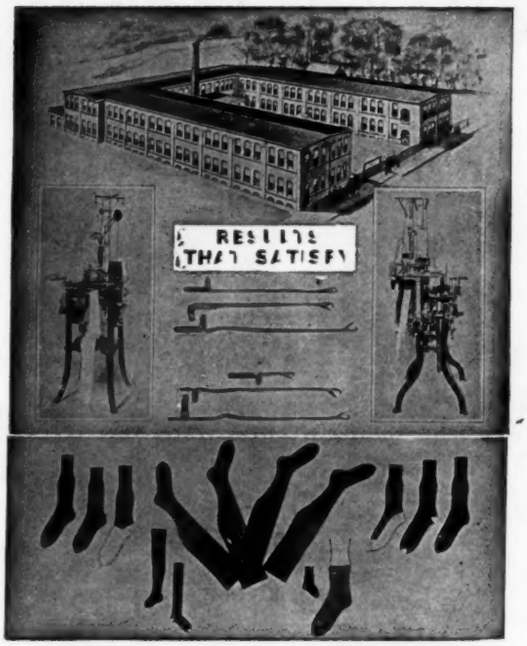
It is good to make a showing on first cost, but a knitting machine is not like a stock table. The knitting machine manipulates every inch of your yarn making first-class fabric, indifferent fabric or waste. This yarn costs **256 times** as much as the best machine, if the latter lasts fifteen years. Buy cheap stock tables if you must. They can't hurt your goods. But buy only the best knitting machinery.

Wildman Mfg. Co.

Established 1889 **NORRISTOWN, PENN.**

Quality of Product Secures for Our Customers



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Acme Knitting Machine & Needle Co.

Franklin, N. H.

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For Knitting the Latest Style Fabrics. FOR

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Write for Descriptive Circular

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Can be done at less cost in less time, better and more uniformly by the gas produced by the

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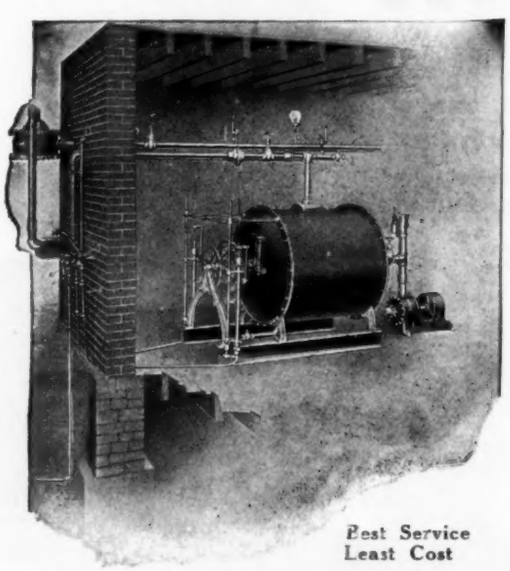

Best Service
Least Cost

Clean, blue flame delivered under the pressure or force best suited for the weight and character of the goods you finish. No air mixed at burners. Write for proposition and catalog.

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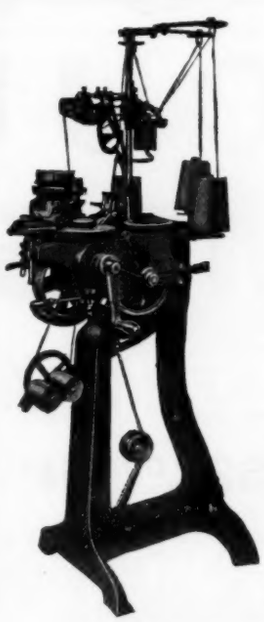

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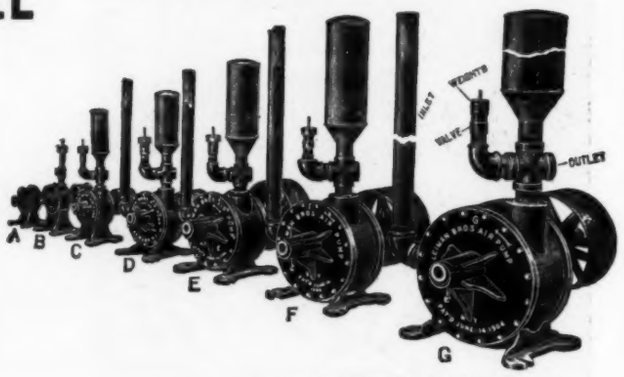
POWERFUL DURABLE NOISELESS

Takes Up Its Own Wear



ABOVE ILLUSTRATION SHOWS 7 OF THE

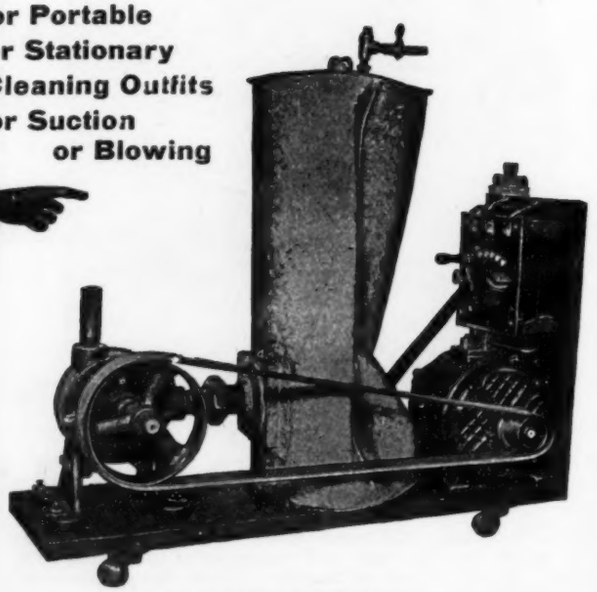
8 SIZES

$17.00 UP

FOR BLOWING OR SUCTION

BLOWERS VACUUM PUMPS

For Portable or Stationary Cleaning Outfits For Suction or Blowing



This picture shows the power of the smallest size vacuum pump we make. The Tank was cross-braced inside and is of heavy galvanized sheet iron. While we do not recommend the pumps for more than 20 in. vacuum, this collapse occurred under test at 22 inches. A quarter horse power motor was used.

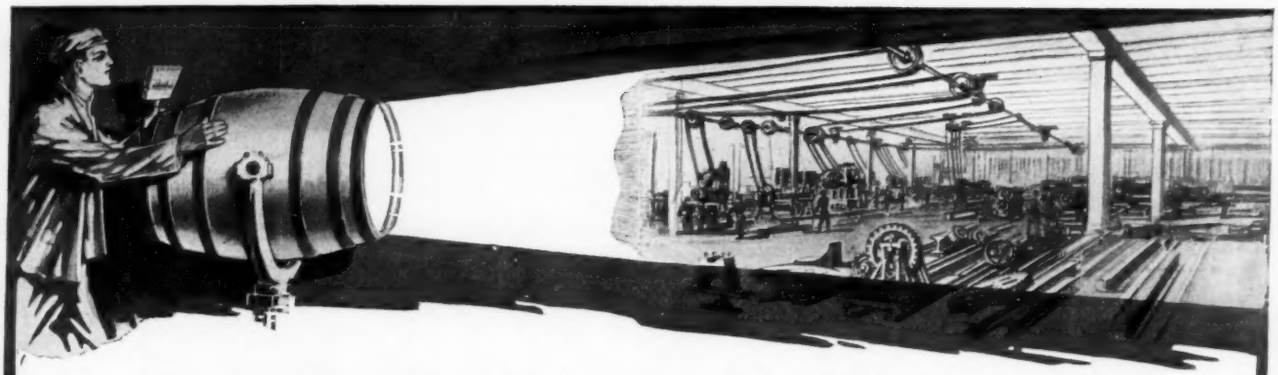
7 SIZES, $21.00 UP

Examine the illustration showing the interior of the machine above and you need not be an expert mechanic to see why they are so very effective. To see why they take up their own wear. To see why they can maintain a very high vacuum. Notice also the comparative size of the piston and the cylinder and also the large interior capacity or displacement of the pump. Compare these features with any other vacuum pump or blower you have ever seen and then we are sure of what your decision will be.

GET CATALOG 350 FOR BLOWERS

" " 351 " VACUUM PUMPS

LEIMAN BROS. 62-ED JOHN STREET NEW YORK



Are you getting the maximum of daylight in your plant?

Or is a large percentage absorbed, swallowed up, *wasted*, in your ceilings and walls? The difference can be reduced to dollars and cents—in your lighting bills, the efficiency of your employees, the quality of your product. You can increase your light 19 to 36 per cent. with

RICE'S MILL WHITE

Rice's Mill White is an **oil** paint giving a **glossy** finish without the use of varnish. It will not crack or craze under the jar of machinery.

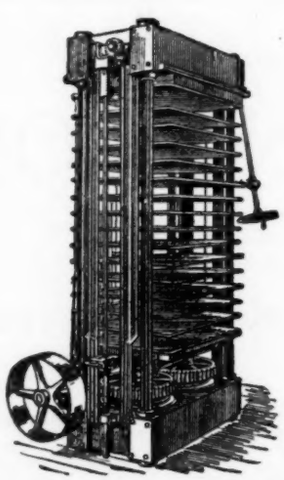
Rice's Paint made the reputation of the name, "Mill White". The special process by which it is made cannot be used by any other paint manufacturer.

Rice's Mill White is sold direct in barrels containing sufficient paint to cover 20,000 square feet, one coat. If you have that area of ceiling and wall space,

Write for Booklet and Sample Board

Ask for a copy of our booklet, "More Light." *Write today.*

U. S. Gutta Percha Paint Co. 22 Dudley Street, Providence, R. I.



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FOR

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IN SIZES

50 to

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Over the leather system before placing orders for new machinery, or if contemplating an increase in production, have them applied to their old machinery.

25 TO 33 PER CENT. MORE PRODUCTION GUARANTEED

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ONE-THIRD LESS WEIGHT REQUIRED

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WRITE FOR POINTS CLAIMED, ALSO PRICES AND PARTICULARS, TO

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Was Awarded GRAND PRIZE at the St. Louis Exposition 1904 for Superior Quality of Goods

HOSE FOR ALL PURPOSES.

Including the Celebrated Brands

EUREKA	PARAGON	RED CROSS
Four Ply	Three Ply	Two Ply

The only circular and seamless woven brands of fire hose that possess four,—three and two entirely distinct and independent plies, and can be entirely separated, and possess four,—three and two warp and filling threads.

FOR FACTORY AND MILL PROTECTION

These goods are especially adapted for use in Cotton, Oil, Woolen, Silk Print, Knit Goods and Carpet Mill, Pulp and Paper Mills, Sugar Refineries, Ice and Refrigerating Machinery, Chemical Works, Tanneries, Etc.

Samples and Full Information given on Application.

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We lower your cost of production from 30 to 60 per cent.
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We produce yarns of better color.
We give you absolutely clean yarns and CLEAN SAFE WORK-ROOMS.
Simple to operate.

The only machine that allows manufacturers to meet the demands of increasingly rigid legislation controlling the health conditions of the work-room.

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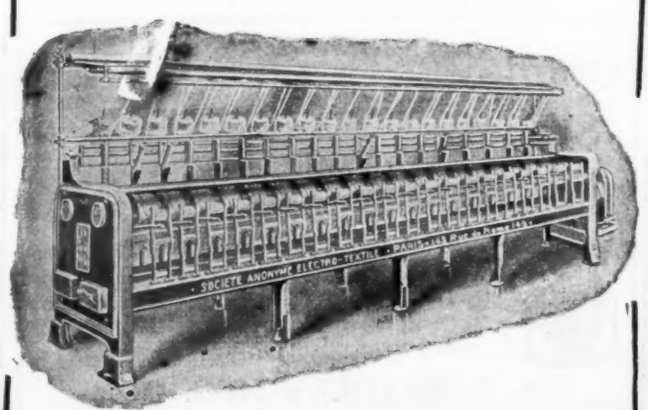

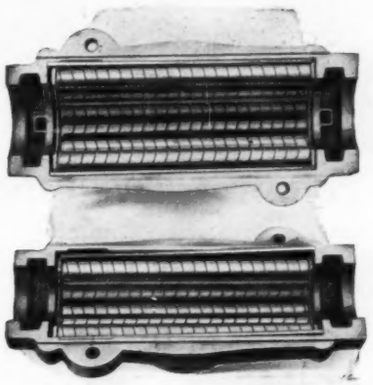

Are You Burning Up Dollars in Friction?

Every old style babbitted shafting box operating in your mill is "burning up" profits just as surely as if you were feeding your boilers dollar bills.

HYATT FLEXIBLE ROLLER BEARING

shafting boxes effect a saving in power that averages 20%. Numerous tests made under all conditions of load and speed and in all classes of equipment justify this claim. **Hyatt Shafting Boxes** have distinctive features not to be found in any other type, including **Flexible Spiral Steel Rollers** which are alternated right and left and serve as oil reservoirs and oil distributors.

The rollers being flexible conform to any ordinary deflection of the line shaft and provide a line of contact the full length of the bearing.

Hyatt Shafting Boxes insure a material saving in power, oil and belts.

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Saves the broom expense. A push broom **with a curve** that throws the dirt and lint to the center.

Let Us Figure on Your Brushes

"Southern Made Mill Brushes Made Right."

D. D. FELTON BRUSH OMPANY

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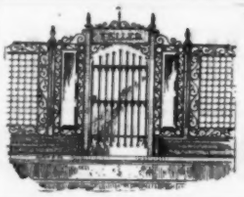

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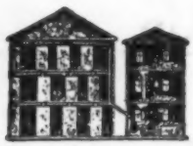

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For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also speed elevators, steam heating and ventilating and mill work generally. Blower and fan work a specialty.
This conveyor is patented. Beware of infringement.

Satisfaction Guaranteed

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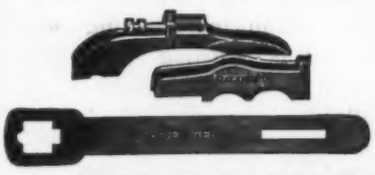

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The weight can be taken off and put on to the middle rolls, without stopping your frames, when long stapled cotton is used. The stirrup is always in place. No bent stirrup resting on rolls. Manufacturers of all kinds of saddles, stirrups and levers. Send for samples and prices. Spinners' Supplies in General.

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is clean, gritless, economical, and perfectly safe.
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Textile Mill **BRUSHES** of Every Description

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Insure you against loss. Its labor, light and money saving properties make it a constant source of profit. It is a paint without the destructive faults of other kinds.

Write for detailed information.

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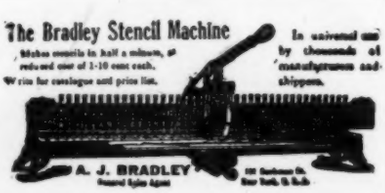
Bradley Stencil Machine



Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 30c or $3.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples.

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CARY'S EVERLASTING FLEXIBLE STEEL MAT

Has a Scraping Surface in Every Direction.
Practically Indestructible.

Rust-Proof
Reinforced Edges

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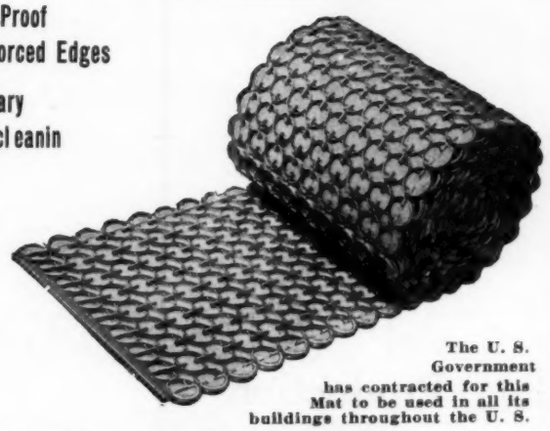
Self-cleaning

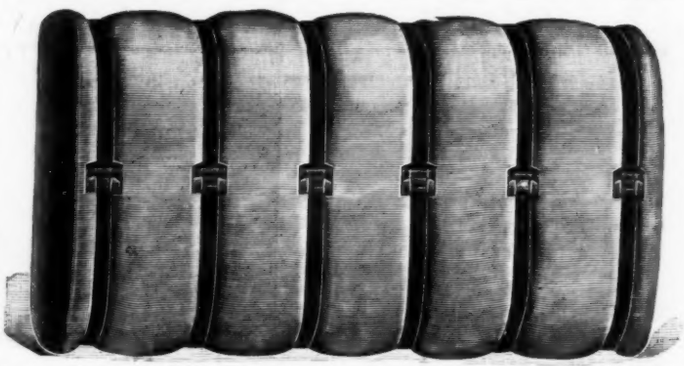


The U. S. Government has contracted for this Mat to be used in all its buildings throughout the U. S.

TEN REGULAR STOCK SIZES.
SPECIAL SIZES TO ORDER

CARY'S BALE BAND AND BUCKLES

THOSE WHO HAVE TRIED THEM SAY THEY ARE THE BEST



THE ABOVE SHOWS A BALE OF COTTON SECURELY FASTENED BY OUR BALE TIES AND BUCKLES
NOTE ITS NEAT AND COMPACT APPEARANCE

Buckle can be applied with the Locking or Hook part next to the Bale, so that there is no possibility of its getting caught in other Bales when piled together.

Also Manufacturers of

TWISTED AND FLAT WIRE BOX STRAPS and a FULL LINE OF SHIPPERS' SPECIALTIES.

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The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

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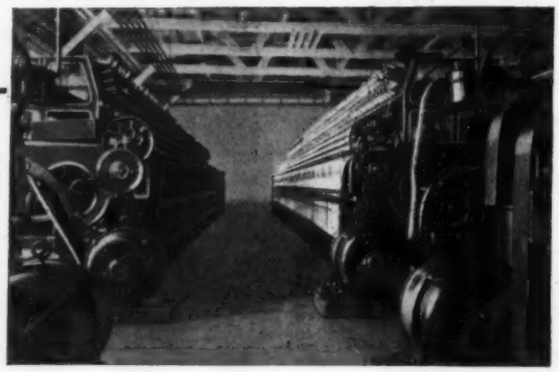

7½ H. P. Westinghouse Textile Motors
Driving Worsted Spinning Frames

The Greatest Possible Production

from any textile machine can be obtained if that machine is driven by the particular Westinghouse Textile Motor made for it. There is a complete line of these motors, differing in size and operating characteristics. Some one of these motors forms the best possible drive for each textile machine.

Westinghouse Textile Motors

are especially designed throughout for textile service and have proven so highly satisfactory that they are in general use for textile work.

The Westinghouse Company, through its textile engineers, will gladly aid in investigations to disclose how economies in textile mill drive can be obtained.

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COLD ROLLED STRIP STEEL

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Plant of B. F. Goodrich Co., Akron, O., covered with J-M Asbestos Roofing.

Composed of *solid asbestos rock* fibres and Trinidad Lake Asphalt, this ready roofing is literally a pliable sheet of stone. It is *all* mineral. Contains no perishable material. Gives perfect fire protection. Never needs coating or graveling. Won't rust, melt, crack or peel. Makes buildings warm in winter and cool in summer. It is the result of over half a century's experience in the manufacture of roofings. Sold direct if your dealer won't supply you.

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THE ONE PIECE FAN WHEEL

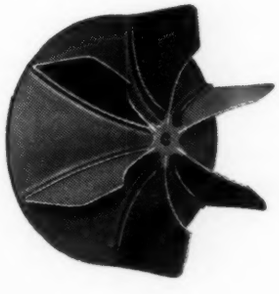
There are no Bolts, Nuts or Rivets to work loose.

This fact, together with the fact that our fans are built strong to withstand very hard usage, makes for efficiency in operation.

THE WHEEL IN OUR

REVERSIBLE FANS

FOR HANDLING COTTON, JUTE, ETC., IS MADE IN ONE PIECE AS THE BLADES ARE CAST INTO A CONE BACK.....



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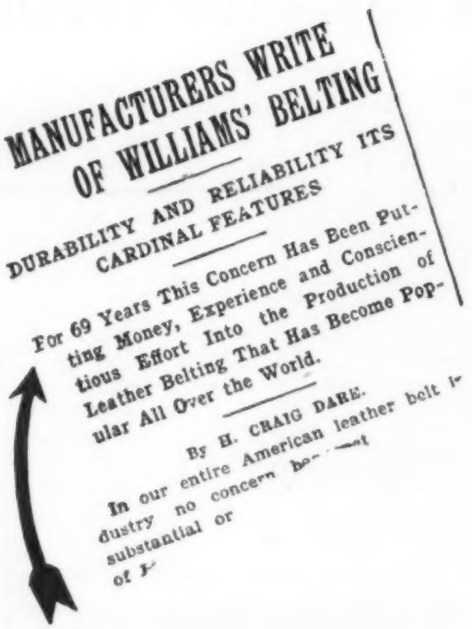
THE NEW YORK BLOWER CO.

General Offices: 25th Place and Stewart Ave., Chicago

Works: Bucyrus, Ohio


MANUFACTURERS WRITE OF WILLIAMS' BELTING
DURABILITY AND RELIABILITY ITS CARDINAL FEATURES
For 69 Years This Concern Has Been Putting Money, Experience and Conscientious Effort Into the Production of Leather Belting That Has Become Popular All Over the World.
By H. CRAIG DARE.
In our entire American leather belt

What the New York Commercial Has to Say About Our Belting

This article is one of the greatest testimonials to the real worth of a line of leather belting that has ever been published by a newspaper of high standing and national influence. It was written by a member of their staff, entirely without our knowledge and is backed up by letters from manufacturers in many different lines, some of them of national prominence.

For more than sixty-nine years Cocheco Belting has been used by manufacturers all over the world and is today admitted to be as good quality as can be made. It is not cheap belting and is not sold on a price basis but we are convinced that it is the most economical belting manufactured.

Let us send you a full reprint of the above mentioned article. Will also send prices and samples, if requested.

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DOVER, N. H.

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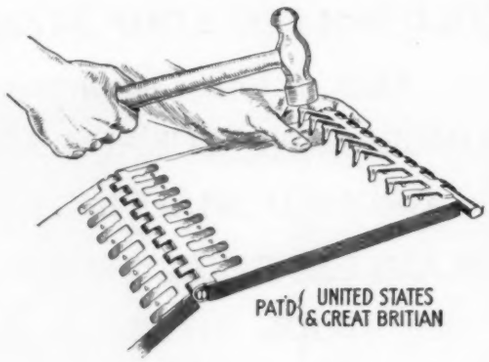
No Tool Required---Save a Hammer



Alligator Steel Belt Lacing

A strong, smooth and flexible joint. Perfectly simple to apply, simply perfect in use.

Saves time and belting. Why not convince yourself—there's no expense or obligation, samples free to any belt user who will state the width, thickness and kind of belt used, when writing.

FLEXIBLE STEEL LACING CO.
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THE COAST LINE TO MACKINAC
DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS, TOLEDO, PT. HURON, GODERICH, ALPENA, ST. IGNACE
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Daily service is operated between Detroit and Cleveland, Detroit and Buffalo; four trips weekly between Toledo, Detroit, Mackinac Island and way ports; daily service between Toledo, Cleveland and Put-in-Bay.
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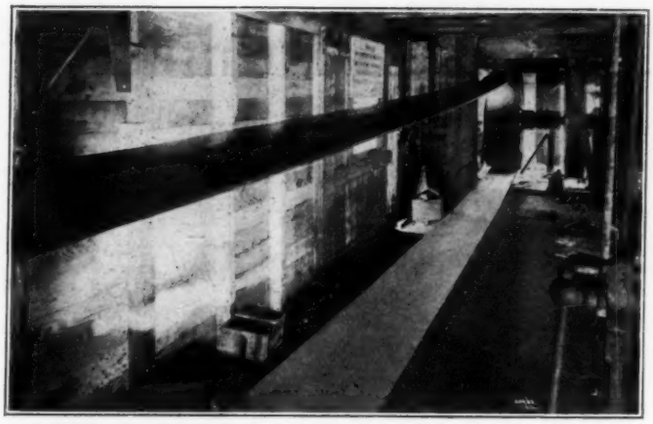
LAKE LINES

Under the Waters of Puget Sound for Eight Days.



The 18" **Neptune** double belt shown herewith was installed on a dredge on Puget Sound, Washington, April 29th, 1911. For several months the belt operated without shelter or covering of any description—it being absolutely unprotected from rain, sun and atmospheric changes.

About Nov. 29th, 1912, the dredge capsized, and for eight days remained at the bottom of the Sound. After the dredge was raised, the belt was wiped off and treated with a coat of our Royal Worcester Belt Dressing—the cement between the plies and at the laps did not start one iota. The belt has been in constant operation since this experience—it runs perfectly straight; in fact, is in as good condition as when first installed two years ago.

Isn't the above strong evidence of the efficiency and economy possible from the use of **Neptune** Waterproof Leather Belting—strong evidence that the belting will fulfill our guarantee—not to open at the laps or between the plies, even though wholly submerged in water?

Send for prices and samples of **Neptune** belting and copy of our **Neptune** Book No. 5.

GRATON & KNIGHT MFG. CO., Franklin & Suffolk Sts., Worcester, Mass.

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Bay State Brick and Cement Coating

"Lights Like the Sun"

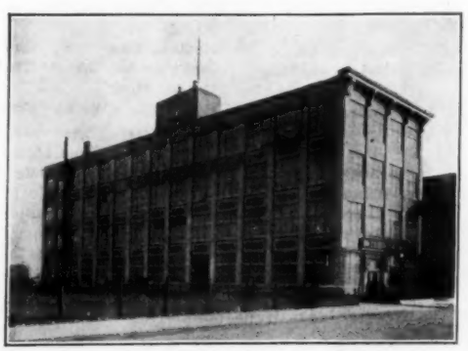
It reflects the light in the darkest rooms and will cut down your lighting bill.

Can be washed and will not chip off when applied over delicate machinery.

Is a fire retarder and when used on wood work lessens the fire risk. Bears the label of the National Board of Fire Underwriters. Can be used equally well in the damp or dry rooms of your mill or factory. Is impervious to moisture or fumes.

Ask your dealer for it. If he cannot supply you write us. Drop a postal for Booklet P that tells you all about Bay State Brick and Cement Coating.

It Was Used Here



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Paint and Varnish Makers and Lead Corroders
82-84 Washington St., BOSTON, MASS.
New York Office, 101 Park Ave., at 40th St.

Good Illumination Reduces Wastage

Prevents Spoiled Work

"Seconds" and inaccuracies in work are avoided by good light. 75% of spoilage in American factories occur under artificial light; 25% of this or over 28 million dollars could be saved by good illumination.

Prevents Faulty Work Passing

A miss or break in the thread is more readily seen and repaired quicker with good light placed right where the operator needs it; thus "seconds," errors, mill ends, are reduced.

Under good light, inspectors examine work better and defective goods that hurt business are less likely to pass.

Advantages of Good Light

In addition, good illumination prevents accidents to operatives and machines; surroundings are more congenial; production is increased; work is more accurate and time and money are saved.

Edison Mazda Lamps correctly placed soon prove the many advantages of good illumination in any textile mill.

Flexibility of Edison Mazda Lamps

These lamps, with drawn wire tungsten filaments are giving the utmost satisfaction in scores of textile mills all over the country.

Because of the wide range of sizes any combination or degree of light can be obtained at any desired location.

Our lighting specialists will assist you in re-adjusting your present system of illumination. Write our nearest office for further information.

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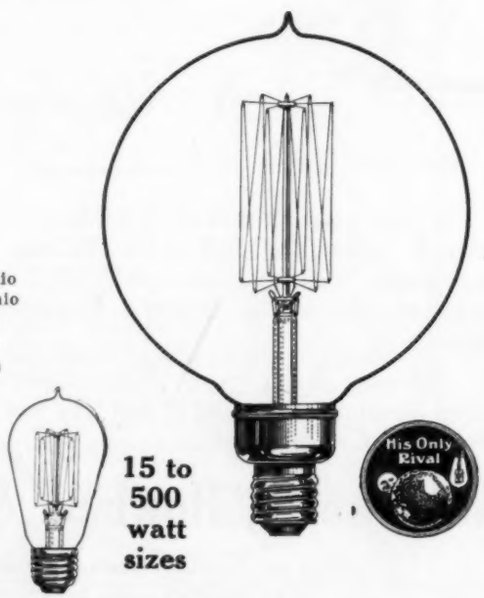
The Guarantee of excellence on Goods Electrical

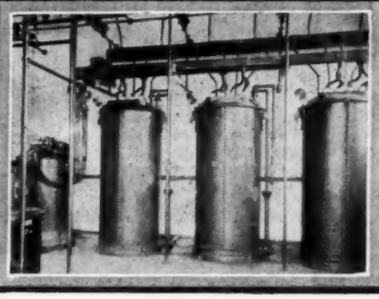
Lamp Agencies Everywhere.



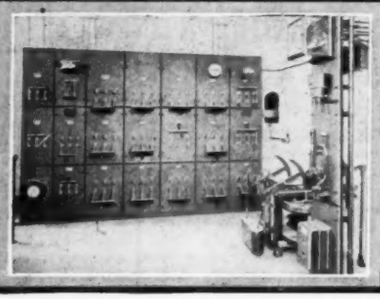
15 to 500 watt sizes

3727

Transformer Room.



Switchboard Room.



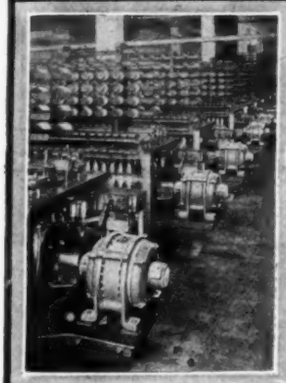
"The Last Word in Textile Mill Construction"

This has been said about the Dunean Mills, Greenville, S. C., which purchased all power equipment from the General Electric Company.

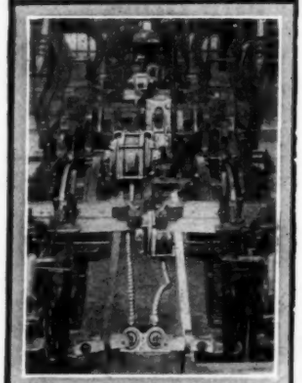
Individual motor driving with G-E textile motors is found in practically all departments. The motors are of a textile type especially designed so as to take care of the varying loads required in textile work. They are dustproof, and have waste-packed bearings as well as taper shafts for the reception of pinions. The Picker and Spinning Frame Motors are equipped with screens and are controlled by oil switches. The Picker Motors are provided with pulleys for belting to pickers and Spinning Frame Motors are provided with steel pinions to mesh with G-E cloth gears on the spinning frames.

Twelve hundred ⅓ hp. 1800 R. P. M. totally enclosed motors are each geared to a loom in the weave shed. Each loom is equipped with a friction clutch and the gear, which forms the friction element of this clutch, meshes with the motor pinion. The loom can be stopped and started as ordinarily, by throwing the lever operating the friction clutch just as is done with a belt driven loom.

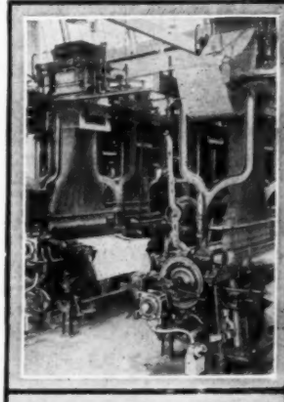
The operation of this equipment has been satisfactory in every way.



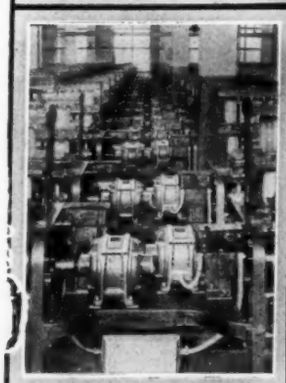
Twister Drive.



Loom Drive.



Jacquard Loom Drive.



Spinning Frame Drive.

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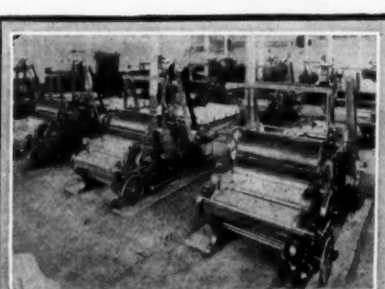
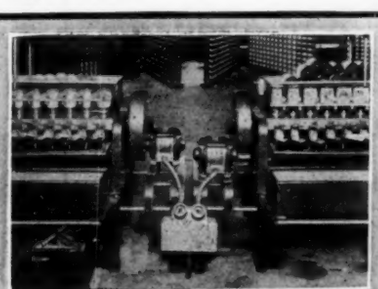
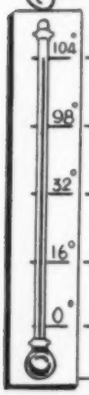


Picker Drive.



Spooler Drive.

BRIEF HISTORY OF NEW MILL IDEAS
AND INCLUDING DUNN FLYERS



- FEVER POINT - DONT WAIT FOR THIS.
- NORMAL PERIOD - PRODUCT ACCEPTED. DEMONSTRATION PERIOD.
- FREEZING POINT. PERFECTED BUT OPPOSED.
- DEVELOPEMENT PERIOD.
- INVENTION PERIOD. } WITHOUT VALUE.

MORE ROVING ON BOBBINS MEANS
LESS DOFFING
LESS PIECING
LESS WASTE
LESS LABOR

DO YOU WANT THESE WITH BETTER ROVING?

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A MINERAL SOAP

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ALUMINA SOAPALITE—For use in Textile Mills where Washing and Bleaching is done.
It has double the cleaning energy of the best fat soap. Made only by
THE ELECTRIC SMELTING & ALUMINUM CO.,
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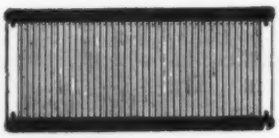
THE NAME **WHITAKER** ON YOUR

LOOM  REEDS

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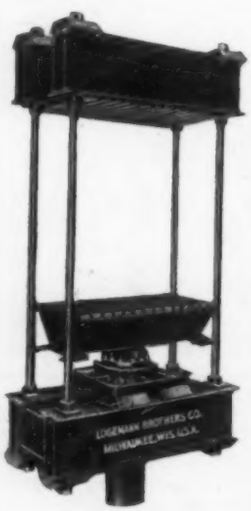

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We guarantee more efficiency with less power than any other press built.

Over 50 Styles—Hand—Belt—Electric—Hydraulic.

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WEAVING AND WEARING QUALITY

We want every user of our loom harnesses to know how well they weave and how long they wear and for this purpose stamp our trademark on the white twine of each harness and label the shaft of each harness with the month in which it is made.

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(This Issue 5,000 Copies)

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THE QUESTION OF RULES AND REGULATIONS.

At the recent meeting of the National Association of Cotton Manufacturers, Arthur H. Gulliver read a paper in which he discussed the relation between the foreign born operatives and the mill management. In this paper he made particular mention of the difficulties that have arisen within the past few years because of the various languages which have been brought into the mill by the different foreign operatives employed. This necessitated the writing of elevator notices, the changes in time and wages, etc., in four or five or sometimes more languages.

He said further, and said most truthfully, that "no concern can afford either to have a temporary or continuous misunderstanding with any of its employes, no matter how small the wages, nor how insignificant the duties performed. It is fully as important," he continues, "that the minors and low-priced women in our employ, as well as the dollar a day men, should feel that the amount they take weekly from their envelopes should not only be what they understand we agreed to pay, but that this amount should be regular and its receipt should be certain."

In a great many mills the factory rules and notices are posted upon the walls and after a little while, the cardboard becomes soiled and damaged and none of the older employes and only a few of the newer ones bother with these rules at all. Furthermore, in the case recently outlined by Mr. Gulliver, these rules would have to be prepared in many different languages to be available to all of the operatives, and still, no one of the management would be sure that all the operatives had so read and understood the rules.

In some mills a small book of factory rules and regulations is prepared and whenever a person enters the employ of that mill, he or she receives a copy of this book and acknowledges by signing a special book, which is kept by the company for that purpose, that he or she has received this copy of rules and regulations and is entirely familiar with the contents of same. Thus no excuse can be made about not knowing what these rules and regulations are.

We are printing herewith a set of rules and regulations adopted by a prominent manufacturing plant, a large part of whose product is used by druggists and the medical profession, and it is therefore necessary for this plant to be in as clean and sanitary a condition as possible. They have perhaps emphasized certain rules in regard to cleanliness that other mills might criticise as too stringent. However this may be, changes could be made to adopt them to any locality or any mill. In the booklet in which this particular set of rules are printed, under the head of working hours, there is printed the days of the week and blank spaces left before A. M. and P. M. to indicate the exact hours which the particular operative to which this book is issued should be subject. This, however, would apply only in mills where various operatives work different hours according to their special classes of work. Another adjunct which no doubt

would be of considerable benefit in mills employing foreign operatives, would be to incorporate a paragraph in regard to wages, leaving the necessary blank for filling in the amount of wages paid per hour or per piece, whichever way the operative was to be paid. These books could be printed in the different languages to accommodate them to the use of the operatives of various nationalities that were employed by the respective mills, and with the operative studying this book at his or her leisure, there would be absolutely no opportunity for misunderstandings or disagreements between such operatives and the mill management in regard to such rules or wage agreements. Following are the rules and regulations referred to:

Section 1. Every person already in our employ or entering same must acknowledge by his (or her) signature that he (or she) has knowledge of our rules, which are made in harmony with the state laws and the pure food and drug law in particular.

Section 2. Every overseer of the various departments is responsible for the work done in his department, and therefore, has the right to hire and discharge help under his charge, but no concession in wages above the standard scale will be recognized by this company, unless especially agreed upon with superintendent or manager.

Section 3. Every overseer must instruct, personally, new employes about the work, pointing out the consequences of carelessness, and give every new employe the best assistance to his ability and knowledge.

Section 4. Wages are based upon the hours of actual working time, unless special arrangements are made.

Wages are paid every Saturday after closing time.

All work done Thursday after 6 p. m. will be paid on Saturday of the following week.

Working hours are, etc.

Section 5. All employes working on piece work are expected to work the same hours, unless otherwise arranged with the overseer of the department.

Section 6. The blowing of the factory whistle shall be the signal for starting and stopping machinery and work. No employe has the privilege or right to leave the factory before closing time, and no overseer shall grant privileges for getting ready in order to leave the factory when whistle blows.

Section 7. Employes coming late shall lose fifteen minutes' time for every five minutes they are late.

Section 8. Employes are not allowed, without permit from overseer, to leave the factory during working hours to visit homes or stores in the neighborhood.

Section 9. Defects in material or machinery must be reported at once to the overseer of the department, and if not attended to by same in reasonable time, the office should be properly notified.

Section 10. No employes are allowed to start or stop any motor without special instructions in each and every case from the superintendent or manager; employes disobeying this rule will be held liable to the full extent of damage done through their disobedience.

Section 11. Employes are not allowed to ride on the elevator, as this is dangerous, and therefore strictly forbidden; any employe violating this rule does this on his or her own responsibility, and assumes the risk of getting hurt.

Section 12. Of each individual will be required, at all times, general personal cleanliness, such as frequent bathing, clean clothing, clean habits and practices.

Section 13. All employes must keep not only their hands clean, but also their clothes and shoes, and those working in the finishing room must clean their hands with soap and water before resuming work.

Section 14. Spitting on the floor and walls is strictly prohibited.

Section 15. Chewing tobacco is not favored, and when employing help preference will be given to the persons who will not chew any tobacco.

Section 16. Persons having any form of skin disease or sores, etc., will not be allowed to engage in this work.

Section 17. All employes must wear special suits or dresses when entering the department and when at work.

Section 18. It is strictly forbidden to carry any other kind of matches than those furnished or sold by this company.

Section 19. Paper or cotton waste must be put in special baskets or cans, and under no condition be thrown on the floor.

Section 20. No spare clothing, old shoes or apparel of any description are allowed in the working room.

Section 21. All suits and dresses which belong to the business must be properly taken care of at all times, and returned in a clean condition when operatives leave our employ.

Section 22. It is distinctly understood that all suits and dresses which belong to the concern are only loaned and always considered as the property of the concern.

Section 23. No visitors are allowed, but relatives and friends may be seen at the main office.

Section 24. Employes are expected to remain in their own departments, except when their work calls them elsewhere, and no interference with work of other departments will be permitted.

Section 25. Complaints of any nature shall be taken up with the overseer first, and if no satisfactory settlement can be arranged, next with the superintendent, and finally with the general manager, but leave of absence will only be decided by the overseer of the department.

Section 26. The use of telephone is allowed between dinner hour and after closing time, but urgent messages will be transmitted after being received.

Section 27. This company reserves the right to discharge any employe at once for the following reasons:

a. Disobeying any of the rules of this company.

b. Destroying or damaging any of this company's property or material.

c. Using profane language, being intoxicated or bringing liquor of any form into the factory.

d. Smoking tobacco in factory and other buildings, boiler room and office excluded.

Section 28. All wages due to a discharged employe will be paid at once, provided the discharge is not for reason under section 27 b in which case the due wages are held as security for part or whole settlement of damage.

Section 29. Employes who have the intention of leaving our employ are requested to give sufficient notice, otherwise no re-employment or recommendation can be considered.

Section 30. Employes unable to come to work shall send message direct or by telephone until 9 a. m., otherwise their position may be filled by someone else.

Many mills also accurately define the duties of the overseers as well as the duties of the operatives. We also print herewith the contents of a little pamphlet issued by this same mill for the instruction and use of its overseers. These

rules are headed: "Duties of Overseers," and are as follows:

The position of overseer is considered a position of trust and a connecting link between the employes under his charge and the firm.

We expect that every overseer be impartial and expect a fair day's work from every employe under his charge.

All employes are paid according to the work and their ability, and no employe shall be kept for pity's sake, if the work is below the standard.

It is expected and considered the duty of every overseer

(1) To bring their department to the highest efficiency.

(2) Keep their department as clean as possible, not allow any dirt or rubbish of any kind to collect in the room and less accessible places or corners.

(3) Give every new employe best possible instructions about the work, and especially instruct him or her in presence of an elder employe about the dangerous parts on or around machinery.

(4) It is expected that every overseer shall be the first one in their departments in the morning and the last one leaving at closing time. If prevented the superintendent or manager should be notified.

(5) No overseer shall leave the factory during working hours, unless notifying the superintendent, or if same is absent, the office, so that proper supervision of the room can be arranged.

(6) Every overseer unexpectedly called away from the city, or unable to report for work, can any time notify the general manager, at his residence, by message or telephone.

(7) Every overseer shall take good care of the machinery and material which is used in his department. Every ounce of cotton, paper, oil or chemicals which is wasted is a loss to the income of this concern.

(8) Every overseer is especially requested to keep their machinery clean and in good running order, thus avoiding break-downs, which cause the loss of production, heavy repair bills, and reduce value of equipment.

(9) All orders for material, belting, chemicals, piping, etc., must be made out in writing with date and signature affixed so the office can take proper care of it.

(10) Do not delay repairing or reporting to superintendent or office, break-downs, leaks, or other matters which will endanger the life of any person or cause damage to machinery or building.

(11) Oily, dirty or wet cotton or waste must be properly taken care of, otherwise it will become useless to be worked over again.

(12) No overseer shall allow in their department any person with questionable reputation or police record, but before discharging such employe, investigation should be made.

(13) All reports must be made out properly to the best of knowledge and sent to the office the day when due, and no guessing, under any circumstances, should be made on production and weights of material and chemicals.

(14) The concern is always willing to take into consideration any suggestion made by an overseer or by any employe under their charge, and if the improvement will benefit the concern to a large extent, the employe will also be benefited by same.

This subject is a very interesting one for mills both north and south, and inasmuch as the various classes of operatives in different sections of the country differ, it would be well worth while to have more or less discussion from interested mill managers and others in every textile manufacturing section furnish views as to the desirability of rules and regulations the same or similar to those printed here, and if changes are to be made, what those changes should be and why they should be made. Managers of spinning, weaving and knitting mills are all interested in this question of help management and the overseers of the various departments of the mill are also interested in operating their departments in the very best and most efficient manner possible. This makes it better for their personal comfort in the mill, and also for their reputation as producing overseers. All should study this phase of the question and offer suggestons or criticisms as they believe them to be necessary if these rules were applied to their own mills. Would it pay to have such a set of rules and regulations standardized? COTTON will gladly devote the necessary space for any suggestions or discussions that may be advanced.

OFFICIALS OF MILLS TAKE NOTICE!

DO YOU USE COMPREESED AIR FOR CLEANING IN YOUR MILLS?

After the practice of using compressed air for chip cleaning purposes became more general in machine shops some few years ago, news notes began to make their appearance in the daily press concerning the application of this power to serve the ends of the would-be practical joker. Unfortunately for the victim of such brutal horse-play, it always resulted in the inflation and rupture of the intestines and often in a horrible and agonizing death.

The first case of this kind noticed after the adoption of compressed air in cotton mills occurred recently in a North Carolina mill. According to press reports the injuries sustained by the victim of this hazing, who was a doffer boy about fifteen years old, necessitated an operation and the insertion of 75 stitches in his intestines by a surgeon. His recovery is reported as doubtful.

We have heard of no case of this kind where any punishment was ever meted out to the perpetrators thereof, although it is evident that they could be legally held on a manslaughter charge whenever fatal injuries result.

We are not interested in punishing such offenders nearly as much as in the prevention of similar crimes in the future. It is unthinkable that any sane person would seek to inflict such injuries on a companion knowingly and it is the duty of every mill official, where compressed air is used, to post warning placards notifying the operatives that the application of compressed air nozzles to certain sections of the body is sure to result in intestinal rupture and probable death. Do not trust to the mere threat of discharge to prevent such occurrences in the future, but make certain that the horrible results of such an act are thoroughly understood. Don't wait until tomorrow, do it now!

It is estimated that the active cotton consuming spindles of the world for the year ending August 31, 1912, was 140,996,000.

The number of active spindles in the cotton-growing states in April, 1913, amounted to 11,904,521.

Georgia Cotton Manufacturers' Association.

Columbus, "the electric city," will be long remembered by the members of the Georgia Cotton Manufacturers' Association who were in attendance at the thirteenth annual convention of this association at Columbus, Georgia, on May 9th and 10th. While the number of mills represented was not large, probably owing to inadequate publicity, those present took an active part in the discussions and thoroughly enjoyed the entertainment features tendered.

As the writer descended from the "Pullman" and strolled toward the hotel, perhaps the most striking point about the city was the wide, well kept streets. Approximately 175 feet wide, with intermediate grass plats 30 feet or more in width between the sidewalk and the curb and extending away into the distance to narrowed and converging points of green, bordered by the lighter gray of the sidewalks.

Columbus, the county seat of Muscogee county, is situated on the east bank of the Chattahoochee river, the dividing line between Georgia and Alabama. It was incorporated in 1828, having been a trading point with the Indians for some time prior to that date. Four dams built across the Chattahoochee furnish about 70,000 horsepower, which is utilized not alone by the local factories, but through transmission wires electric power is delivered to several other neighboring cities.

Seven railroad lines radiate from Columbus and steamship lines operate continuously between Columbus and the Gulf of Mexico, thus making the city the logical trading point for a very large territory.

The greatest single manufacturing interest is the manufacture of textiles. In January, 1913, the various mills had a total of 273,652 spindles and 5,492 looms. Besides the cotton mills there are three large hosiery mills, nine fertilizer plants, foundry and machine shops, school desk factories, show case plants, wood-working plants and many minor industries of various kinds. The cotton mills alone giving employment to over five thousand persons.

Columbus also supports one of the finest public school systems in the entire country, including an industrial high school splendidly equipped for advanced training in textile, machine work, etc. The public library is also operated under the direction of the school trustees and is part of the system. A marble Y. M. C. A. building bears evidence as to the quality of the support tendered by the citizens and cotton manufacturers.

It was in response to the cordial invitation of the members of the Columbus Textile Manufacturers' Association, representing the twelve mills located here, that the Georgia cotton manufacturers foregathered.

MORNING SESSION.

At 11:30 o'clock Friday morning, May 9th, President Gordon called the meeting to order in the Board of Trade rooms, and introduced the Rev. I. S. McElroy, pastor of the First Presbyterian church at Columbus, who offered the invocation. The roll call and reading of the minutes was dispensed with by vote and the first address of welcome was delivered by the Hon. L. H. Chappell, mayor of Columbus, on behalf of the city. He was followed by the Hon. S. P. Gilbert, president of the Board of Trade, who welcomed the visitors as the representative of the business men of the city. President Gordon then called upon Captain H. P. Meikleham, agent of the Massachusetts Mills in Georgia, who made a happy response to the two previous speakers on behalf of the association.

PRESIDENT'S ADDRESS.

President Gordon then delivered the annual address in which he forecasted a period of depression in the cotton manufacturing industry because of impending tariff legislation. His address, in part, was as follows:

"On behalf of the members of your executive committee and in accordance with the legal call sent out by our secretary, it becomes my duty and great pleasure to call to order, this the thirteenth annual convention of our association.

"It is peculiarly a pleasant duty to open this convention, as our association meets for the first time in my home city, whose officials have extended to you the felicitations of the occasion.

"Financially, it has been our best year with the largest paid membership in our history, and while for some reason a few of the prominent mills of the state do not aid the organization and themselves by becoming members, yet on the whole our association is representative of the views and desires of the large majority of mill managers of the state.

"Your executive committee has met as often as it seemed necessary during the year. These meetings have been well attended and complete harmony has prevailed as to policies to be pursued by our various committees in charge of the association work, and I wish to thank the members of the executive committee for the splendid support and encouragement they have given to the officials of the association.

"Special praise is due your secretary and treasurer for his able business methods in handling the association's affairs during the year. The standing committees have done faithful and effective work. With the new year I would recommend the appointment of new standing committees as follows:

"Committee on Power and Lighting.

"Committee on Cotton Baling and Tare.

"Committee on Coal Buying.

"Committee on Waste, Bagging and Ties.

"The desirability of these committees can be discussed at the proper time during the convention.

"The general and important issues which have been before us during the year have been labor legislation, proposed in our state legislature, and the pending tariff legislation in congress. As to the relation of this organization to state legislation, I believe I can no better voice the sentiment of its membership than to quote from a recent statement published on this matter as follows:

"'Our legislative committee, composed of broad-minded and patriotic men, is not, as some suppose, a "fighting machine;" on the contrary, it is anxious to meet the lawmakers of Georgia on the common ground of the good of uplifting the greatest number. It believes in the uplifting of the masses of the people as frevently as any altruistic association in or out of the state. It believes in the right of labor to organize, when such organization strictly observes the laws of the state and the constitution of the United States.

"'It does not believe that at the instance of foreign

labor organizations, through paid emissaries, the Georgia legislature should enact class legislation, aimed solely at the cotton mills of the state (its greatest industrial asset) which do not apply equally to all other manufacturing interests, large business concerns and public utilities offering employment to the people of Georgia. The work of this committee has been all important in the past, and will so continue as long as the cotton mills of Georgia are singled out for unfair and unripe legislation instigated by the people unacquainted with the real economic and sociologic conditions involved.'

"I can say to the critics of present cotton mill conditions in Georgia, that the men in charge of those mills are anxious first, for a compulsory education law in Georgia, and in proportion as the children of the poorer classes, now working in the mills, are provided with school facilities and made to go to school, just in that proportion we hope to see their places in the mills supplied with more adult labor.

"Until this is done our position will be based on common sense observation of actual conditions, that while we deplore that any child has to be poor, or has to work for a living in a cotton mill or elsewhere, that until the state supplies the place and forces the parent to exercise the proper authority to place the child in school, that it is better for the child to be learning habits of industry through some employment somewhere, than to be learning the ways of vice and vagrancy on the highways of the state.

"Concerning the tariff legislation, now the principal subject of discussion before the present special session of congress, I would remark that it is a little late to go further into any elaborate discussion of what the enactment of the proposed tariff bill means for our association and the prosperity of its membership.

"The protest against radical cuts on cotton goods instead of reasonable cuts have been made by all the cotton mill associations in the country.

"We are now about in this position: The cotton mill train on which we are all passengers, and which has been running along pretty smoothly on schedule time through what we thought was a friendly country, has been held up by a lot of bandits, not the usual cut throat variety, but much to our surprise, we find them to be our own legislative servants. They do not say 'your money or your life,' but do say what we believe means our prosperity if not our very lives.

"In substance they explain that they regret to treat their masters in this way, but that they know what is best and must cut down these legitimate profits so they can divide the money to better advantage. When the people who built the mills, and the people who keep them going, and the farmers who raise the cotton to supply them, all in due time begin to feel the disastrous effects of this holdup, then these same conscientious, able, bandit servants will be looking for other jobs.

"I congratulate the mills of Georgia on recent generally prosperous conditions as compared with former years of depression. But the black cloud of national legislation looms up and cannot be disregarded.

"I do not desire to be unduly pessimistic, or to take front rank as a 'calamity howler,' and if asked for an opinion as to the outlook I would rather make a prophecy. That propheey would be that beginning with this summer our cotton mills will face a long period of depression. Only those strongly entrenched financially, with strong trade connections and able to use foreign markets to some extent will stay in the race. It's to be a survival of the fittest.

"Lamentable as the conditions may be and as strongly as we may hope they may not come, yet can we foresee anything but rigid economy in the buying of cotton and supplies, and worst of all the cutting of pay rolls to the last notch? Meanwhile these conditions are inevitable and must be faced with that same ability, grit and determination that has built up the magnificent industry represented in this convention. Remember, 'that the man worth while is the man who can smile when everything goes dead wrong.'

"Don't forget that much good can come from cooperation among our members. Sustain your state and local mill association."

President Stuart W. Cramer, of the American Cotton Manufacturers' Association, who was to have made an address at this session wired his inability to attend because of urgent business elsewhere.

A resolution from the tariff committee was read and it was voted to amend this to some extent and transmit same

F. B. GORDON, RE-ELECTED PRESIDENT.

by telegraph to the various officials at Washington named therein. President Gordon appointed Mr. Meikleham, Lindale; Mr. Broadbent, Columbus, and Mr. Dallis, LaGrange, a committee to revise this resolution.

During the deliberations of this committee, President Gordon had a communication read into the minutes and the question will be referred to the new committee on cotton tare. Extracts from this communication follow:

F. B. Gordon, President, Cotton Manufacturers Association of Georgia:

I desire to thank you for the privilege of conferring with your association on questions of mutual interest to manufacturers and producers of cotton.

I enclose a resolution of the Georgia legislature showing the object and appointment of a joint committee. This committee authorized the writer to carry on this work and act for them, and I can but feel the great responsibility and the need of assistance.

First. I would call attention to the question "Cotton tare" against the American bale, as treated in the resolutions.

Second. The several demands made by a convention of cotton interests in New Orleans March 3rd and 4th, 1913, though of great importance and affecting the interests of the manufacturer and producer, neither of these had any voice in the convention. They demanded as follows: The weight of a standard bale to be 500 pounds, press box 24 x 54, cotton bale to be wholly covered and thoroughly protected against damage in transit. Marking of the bale so as to insure identification at destination. Because of the unsuitable, flimsy and insufficient covering, that does not protect the cotton, the American bale is condemned as a most shameful evidence of wastefulness, resulting in a loss of $50,000,000 per annum. They require the B/L to describe the *actual condition* of the bale. The bales to be marked with a good quality of ink that will not fade, rub or wash away, and marks to be placed between bands. For a *noncompliance,* penalties will be levied and extra freight will charged. Circular letters are being sent out to farmers and ginners covering above points.

While these rules generally apply to bales for foreign shipment, you are certainly much interested in them, and entitled to a consideration in the cotton baling system.

I do not feel that we are prepared, with the various conditions and emergencies confronting the producer of American cotton, for a standard bale that is arbitrary and too precise. A press box 24 x 54 is impracticable, would result in a frequent bursting of press box, breaking or bending of press pin and require much heavier and stronger ties, thus adding to the "tare." I, however, have just learned that the New Orleans Exchange is ready to recede from this demand, and accept cotton from a box 27 x 54. I do not know about other interests. It looks a little bit tough, if a producer has not enough cotton to make a bale of 500 pounds, or has more than enough, and is forced to make it heavier, that a penalty is to be levied.

As to the demand to wholly cover our cotton, I think it should be done, but the *exporter* who was represented in the convention referred to, forbids the use of over 6 yards of 42 or 44 inch bagging, and this will not wholly cover or protect our bale of cotton, even after compression. I also think it should be legibly marked, but how can we do this on the ordinary jute bagging, fish-net variety, cut to pieces with sample holes, or much of it so ragged and rotten that it is unfit even for a "dog's bed?" As a result thousands of bales are a disgrace to agriculture, prejudice is on the increase and additional expense is enacted from the producer and the manufacturer.

I have learned it is much easier to make demands than to comply, and the friends in the New Orleans convention should have shown us how to fully comply. A reform in the cotton baling system is highly important, our cotton should be put up in decent and respectable shape, and the fact that a claused B/L will be issued, describing in full the true condition, should open the eyes of all and stimulate a reform with the producers.

My idea of a reform bale is to meet the reasonable demands of trade. The weight to be approximately 500 pounds, as near as possible. Press box 27 x 54. Bale to be wholly covered and fully protected by a strong, smooth, closely woven covering that can be legibly and durably marked, fully 52 inches wide and well secured with good twine at the ends, also a weight sufficient to approximate the "tare charges." By this covering the bale could be protected from an accumulation of trash and dirt before shipment, prejudice could be removed, freight and insurance rates reduced, the trade better satisfied, and instead of arbitrary tare of 6 per cent adopted years ago, a new and righteous tare by mutual agreement of a standard and guaranteed weight could be legalized and made satisfactory to manufacturers and producers and much confusion and conflict avoided.

A hearing before the committtee of Interstate and Foreign Commerce has been in contemplation as to the cotton baling system and a reformation of American cotton bale. The New Orleans convention referred to above, appointed delegates to go before this committee. I have been notified that I would be called upon to appear when this hearing is called. I would not do an injustice to any interest, and feel that the manufacturer and producer are directly and more interested than others.

I would be glad to have in full, the views and wishes of the Association of Cotton Manufacturers of Georgia, as to reform bale, tare and the new demands on a cotton bale. I feel sure our interests in many respects are identical and I certainly hope we can work together for mutual benefit.

(Signed) T. M. Kimbrough,
For Legislative Committee of Georgia.

The special committee then made its report and the following is the text of the amended resolution:

"Whereas this Association has always favored a proper revision of the tariff on cotton yarns and fabrics,

Resolved: That in our judgment, the reduction in duties on cotton yarns and fabrics proposed by the Underwood tariff bill now before Congress, if passed, is too drastic and will cripple our industry, particularly on plied, combed or finished yarns; also fabrics bleached, dyed, mercerized and fancy weaves and those composed of plied yarns which should have an additional duty over plain cloths in the gray.

We believe the duties proposed by the American Cotton Manufacturers Association are the lowest that will properly sustain our mills and maintain reasonable rates for labor for the reason that the items mentioned above are practically all labor and machinery propositions and the finding of the Tariff Board is that labor and machinery are over 40 per cent higher in America than in England and on the continent.

Considering these facts, we earnestly request the President of the United States, the United States Senate and the House of Representatives to see that the Underwood bill is amended along these lines so that justice will be done our stockholders, our laborers and our country.

An interesting paper entitled "Use of Electricity in Cotton Mills," was then read by D. W. Peabody, of the General Electric Co., Atlanta. Mr. Peabody said in part:

The subject of electric power for textile mills has been so thoroughly discussed in years past at textile association meetings, as well as with the individual mill owners, that I feel you would be more interested in some of the latest applications of the drive and the results rather than a general discussion of the advantage of electricity in the mill over other forms of power.

In order to obtain maximum production all the machines must run at their maximum speed the maximum number of minutes in the working day. The electric motor will approach this ideal result nearer than any other form of power as I will attempt to show in this paper.

The induction type of motor is built in over 200 different standard sizes and speeds, suitable for application to a cotton mill. It can be mounted horizontally on the floor, upside down on the ceiling, or on either wall. It is ruggedly built, giving a minimum of shut downs for repairs. I know of a number of mills that have had motors installed over ten years that have never spent a nickel on repairs. Due to the wide range of sizes and speeds, it is easy to select the most economical working arrangement for each individual case. It will be of interest to note here that when one large manufacturer first organized his mill power department, nearly twenty years ago, the average size motor sold to textile mills was near 200 hp. This average size has been gradually becoming smaller year by year. In 1912 it was approximately 17 hp., which shows that the mills are appreciating the advantages of placing the motor as close to the machine as possible in order to eliminate the maximum number of belts, consequent slippage, irregular speed, poor quality and loss of production that the old-fashioned mechanical drive will give.

Tests made in the past few years prove conclusively that the average well-designed, mechanically-driven mill will lose 3 per cent in production in the spinning room. I have found machines running as much as 8, 10 and 15 per cent below speed in mills where they were not well laid out or carefully checked all the time. The weave room in a mechanically-driven mill is a still worse offender, showing an average of 4 per cent below speed. Please understand me; these conditions are found in the very best designed and operated mechanically-driven mills. These conditions can be improved in two ways:

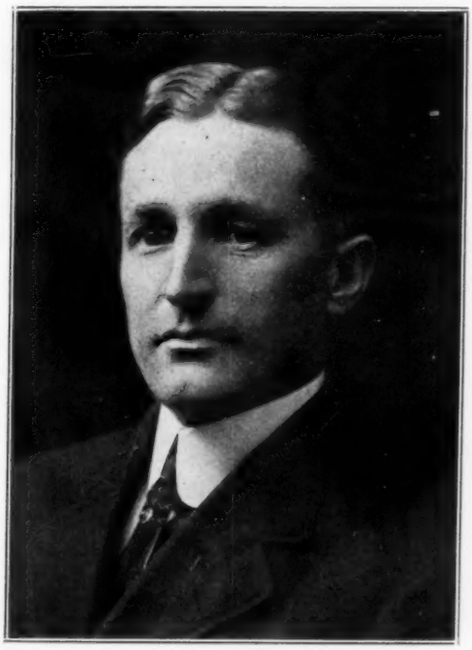
1st. By the most rigid and careful attention to the belts; relieving main-drive belts of overloads they were not intended to carry; tightening belts that have become worn or loose from long operation; re-arranging bad belt drives where the pulley sizes vary too much or the centers are too short; and last but not least, carefully cleaning every belt in the mill at least once or preferably twice every day.

2nd. By the installation of electric motors eliminating the belts as far as possible. The speed of the motor at full load will only vary with the speed of the prime mover driving the generator that is supplying its current, whether water wheel fifty or one hundred miles away, engine or turbine as the case may be.

At least one manufacturing company has specialized in this field for nearly twenty years. They are making tests daily to discover improvements, if possible, in the application of motors to textile machinery. The information already gathered is astounding in the results that it is possible to obtain by the installation of individual motors—that is, a motor direct connected, geared or belted to each machine.

Numbers of tests in different mills in different parts of the country show similar results by comparing similar machines in the same mill for production, part driven by individual motors and part by mechanical drive or a large group motor. The increase in favor of individual motors shows an average of about 10 per cent on ring spinning frames. How do you account for this when I have only shown an average loss of 3 per cent in speed on spinning in the early part of this paper? For the reason that the frame will stay on the job more minutes in the day than the belt-driven frame, has fewer ends down and does not break down as many ends at starting. When you close the switch on the motor, its period of acceleration although short (not over 10 to 15 seconds from no speed to full speed) is easy on the frame. The motor turns over for the first few revolutions gradually until it is about ¼ of its full speed and then comes up rapidly to its normal speed. As against this, in starting a belt-driven frame, you have a belt running nearly a mile a minute on the loose pulley. This is thrown at once on the tight pulley, where most mill men say it slips uniformly, but it does not. It tries to take the frame from no speed to full speed instantaneously, giving the frame a tremenduous jerk; then it slips, jerks again and so on until it finally reaches full speed. It's a wonder that any ends stay up at all with this method of starting.

The results of spinning and twisting frames were so satisfactory, and installations and tests had proved the value of individual motors for heavy looms, that we experimented and tested the results with plain cotton looms and Jacquard looms and found not only increased production but improved the quality in the cloth. In a recent test



HARRY L. WILLIAMS, SECRETARY AND TREASURER.

in the same mill, a comparison of looms on mechanical drive with looms equipped with individual motors showed that the motor loom ran five picks more per minute than the belt loom but produced 14 per cent more yards of cloth where you would only expect 5 per cent. By examination of the cloth you can readily see the effects of the uneven speed of the belt-driven loom, as the force delivered in beating up varies with respect to speed of loom as the square and the only transmission that will give uniform speed on the loom shaft is a motor whose only variation in speed is practically determined by the governor on the prime mover that operates it.

Our tests and experiments so far have shown excellent results, taking everything into consideration (including first cost), in using individual motors on all machines in the mill, with the possible exception of the card room. Our recommendations to a new mill today in general would be to use:

1st: Individual motors in the picker room, mounting motor on the "A" frame and belting to the beater shaft.

2nd: Light group drive for the card room, not over 50 hp. motor. Individual motor with chain drive for the drawing frames. Slow speed, four frame, approximate 15 hp., motors for slubbers, speeders and fine frames or two frame motors of 7½ hp., depending on the machinery arrangement. By "four-frame" I mean one motor to four frames, mounted on the ceiling directly over the frames, the motor-shaft extended at each end carrying two pulleys on each end. This gives one belt from motor to frame.

3rd: Individual motors geared to spinning and twisting frames, 5 to 10 hp., depending on the specifications of the frame, number of spindles, wet or dry, number of ply, etc., on the twisters.

4th: Individual motors for spoolers and warpers.

5th: Individual motors for looms, geared to gear ring, keyed to loose pulley of loom, operator starts with his friction the same as with the belt driven loom.

6th: A small group motor for cloth room.

7th: A small group motor for machine shop.

In addition to the above will be required one either 75, 100 or 150 hp. motor, direct connected to the fire pump, depending on the capacity of the pump.

In laying out a mill on the above lines, the building and machinery plans can be designed to give maximum efficiency in the handling of the cotton to the finished product, their position not being determined to a large extent by economical plans for shafting and belting, but can be placed in the most advantageous position for handling the product. Each machine is independent of its neighbor; if there is any trouble with it, it will go out of service without affecting adjacent machines in regard to speed or shutting them down, as will occur when a belt breaks, throwing off other belts, or when a loom "bangs off," it will affect the speed of the entire line of looms it is on, if it does not shut some of them down.

A mill as outlined above can be built for an excess cost of approximately 2 per cent more than a straight mechanically-driven mill. It will consume approximately 12 to 15 per cent more power but it will produce an average of 10 per cent more goods per annum with practically the same overhead charges as the mechanically-driven mill. In regard to changing over a mill that is already mechanically-driven or has large group motors, a recent case would show that every 1 per cent increase in production would pay approximately 3.5 per cent on the investment. You don't have to figure to see whether 10 per cent increase in production will pay.

I have purposely avoided so far, the question of the relative cost of power under the different systems, in order to bring out the fact that the electric drive will increase the production and the quality of the goods manufactured; and, to assume a sample case, the comparison in round figures will be as follows: The average modern mill's cost of power, including all charges, will approximate 5 per cent of the total cost of production; hence if you save 10 per cent of your power bill, you save one-half of 1 per cent of your total cost of production. On the other hand, if you use this 10 per cent more power with electric drive, and produce 10 per cent more goods, with the same overhead expense, you will increase your gross revenue 10 per cent and your net profit on this extra production will be practically clear, over the price of the raw material, less the extra amount of power necessary to produce it.

If you are driving by steam, you can produce your electric current, with proper steam and vacuum conditions, more economically by using a steam turbine with its generator, and the plant investment will be lower than with an engine on a mechanical drive. The efficiency of the transmission in the mill will be approximately the same in both cases, as long as the shafting is kept in accurate alignment (although it is impossible to accurately test the full load friction of the mill). However, under average working conditions the efficiency of the electric drive should be better as there is nothing to change the loss in the wiring or the efficiency of the motors during the course of their life. The speed of the turbine is more uniform than the engine, as it is a purely rotative machine against a reciprocating type in the engine.

A large percentage of the facts given above have been so well recognized that investors, not only of our own section, but from the North, East, Canada and England, have placed millions of dollars into the development of the South's almost unlimited water power resources to produce electric energy to distribute in large quantities and sell to the cotton mills.

In the Carolinas and Georgia alone there are over one hundred and fifty mills that are equipped with one manufacturer's apparatus that are receiving their power from the hydro-electric companies. This is a great thing, not only for the South but for the textile mills in this section. People who are planning investing their money in a new mill can place the amount necessary to build the power plant in producing spindles, and reap a larger return per dollar invested than if they had it tied up in the power house and its equipment. Others who are already operating and have either to make expensive repairs or buy new power plant machinery, on account of the uneconomical machines they already have, can turn to these companies and receive power with practically no extra investment, if they are already electrically equipped, or, if not, only the cost of the motor equipment, which has been more than justified in the preceeding remarks. In addition to this they can in general buy their power for less money than it will cost them to produce it, if all charges are taken into consideration. And they are assured of the highest class of service with the most expert type of operators—a higher class of men than the average mill can afford to employ when they are producing their own power.

In conclusion I will say that every mill is a problem by itself, and in considering these questions we should go into them carefully and preferably with the assistance and advice of the highest type of consulting engineer available. However, I do not believe there is a mill today that cannot greatly improve its conditions and profit by using the electric drive, if properly applied, to meet the local conditions.

S. A. Carter, chairman of the legislative committee, then read the annual report for that committee and brought up for general discussion a bill that is to be introduced at the next session of the Georgia legislature to be entitled:

An Act to regulate the employment of children in certain kinds of labor as in said Act provided, to prohibit their employment therein below certain ages as in said Act provided, to provide penalties for a violation hereof and for other purposes.

Be it enacted by the General Assembly of Georgia as follows:

SECTION 1. After the year 1913 no child under twelve years of age shall be employed or permitted to work in any

A Glimpse of the Flower Garden at Green Island Ranch, the Summer Home of Hon. G. Gunby Jordan.

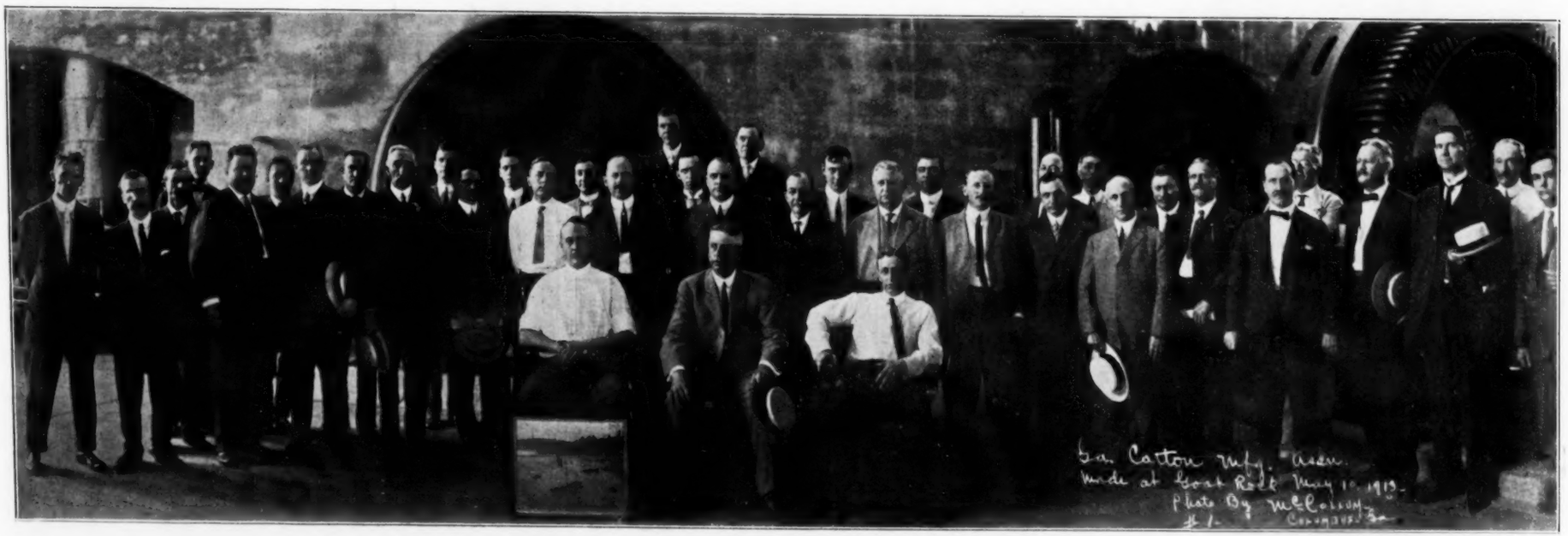


Photo by McCollum Studio.

A Group of Georgia Mill Men at Goat Rock Dam.

POWER PLANT OF THE COLUMBUS POWER CO., AT GOAT ROCK. ULTIMATE CAPACITY, 40,000 H. P.

mill, factory, workshop, laundry, public service, or mercantile establishment of any kind, under any circumstances or conditions. After the year 1914 no child under thirteen years of age shall be employed or permitted to work; and after the year 1915 no child under the age of fourteen shall be so employed or permitted to work.

SEC. 2. Section 3146 of the Code of 1910, which prohibits children under 14 years of age working or being employed in factories unless they can write, and unless they have attended school the preceding year, and which prohibits children between the ages of 14 and 18 from being so employed unless they have attended school twelve weeks of the preceding year, and which requires certain affidavits on these subjects to be furnished the employer, shall be and the same is hereby repealed, and in lieu thereof, it shall be and is enacted, to be effective at once, as follows:

"No child between the ages of 14 and 16 shall be employed or permitted to work in any of the kinds of work specified in Section 1 of this Act, unless such child can read ordinary English and write simple English sentences. In all cases of doubt as to whether such child can comply with these conditions it shall be right of the employer, foreman, superintendent, or other agent of the employer, to refer the question to the State Commissioner of Labor or any deputy or agent selected by him, and the decision of the Commissioner that such child can comply with the conditions shall be a protection to such employer or agent as to work or employment of such child thereafter."

SEC. 3. Any person who shall employ or permit any child to work in violation of the provisions of this Act or be concerned in such violation, or connected therewith, either as employer, or as foreman, superintendent or other agent or officer of any employing corporation, or as parent or guardian of such child or other person having its custody or control, shall be guilty of a misdemeanor.

SEC. 4. Be it further enacted that all other laws and parts of laws necessarily in conflict with the provisions of this Act shall be and stand repealed when and as this Act takes effect, but not such as are cumulative hereof and not necessarily in conflict herewith.

After some general discussion, President Gordon called upon Capt. H. P. Meikleham, the chairman of the traffic committee, for his report, which was then read. Because of the hour, discussion was deferred until the evening session and the meeting adjourned.

The members and guests then proceeded to the Muscogee Club where they were entertained at a buffet luncheon by the Columbus Textile Manufacturers' Association.

At the conclusion of the luncheon, automobiles were provided for all desiring to go and the delightful two hour ride was enjoyed by the majority of those present. The route was arranged so each mill was passed as well as other points of local interest. On the special invitation of President G. Gunby Jordan, of the Eagle and Phenix Mills, the entire party then proceeded to his beautiful country estate, "Green Island Ranch," where a stop was made to enjoy the natural beauty of location as well as the landscape gardener's art. We are reproducing a view of the flower garden with Mr. Jordan's home in the background. Visits were then paid to a number of other places, including the Country Club, where a champion golf match was being pulled off and in which Messrs. Cuddy and Hazlewood trimmed Messrs. Broadbent and Holden in a "high ball foursome," three down and two to play. Messrs. Cuddy and Hazlewood expressed a belief that the fact of their winning was because they stuck to the "Scotch," the game being of Scotch origin, while Mr. Broadbent intimated that it was because Mr. Holden insisted on putting "English" on the ball, which is usually an unsuccessful expedient in a "Scotch" game.

EVENING SESSION.

Promptly at 8 o'clock Friday evening President Gordon rapped for order and Harry L. Williams, the secretary and treasurer, read his annual report. This was followed by the report of the auditing committee.

Hon. A. W. Cozart, of the Columbus Bar, (bar, in this instance meaning a body of licensed lawyers), then proceeded to weave some tales and spin some yarns, in both of which occupations (being a lawyer) he was very adept and amusing.

Captain Meikleham then continued his traffic committee report, which aroused much discussion among the members present. This was followed by an interesting talk by Mr. Chears of the traffic bureau.

At the suggestion of President Gordon it was decided to select a place for the 1914 convention before the meeting adjourned. Several invitations were received, but it was voted to accept that of Clyde L. King, president of the Georgia Cotton Mills, at Griffin, to meet in Griffin at approximately the same time next year.

Resolutions were adopted thanking the Board of Trade, the Columbus Textile Manufacturers Association, the Columbus Power Company and others who assisted in

making the visit to Columbus such a pleasant duty.

The nominating committee reported and the following officers were unanimously elected for the ensuing year:

President, F. B. Gordon, Columbus.

Secretary and Treasurer, H. L. Williams, Columbus.

Vice-presidents and also members of the Executive Committee: C. V. Truitt, LaGrange, Allen F. Johnson, Atlanta, George H. Lanier, West Point, C. B. Caperton, Trion, J. H. Porter, Macon, W. J. Vereen, Moultrie, F. T. Hardwick, Dalton, and B. R. Blakeley, Griffin.

Executive Committee: H. P. Meikleham, Lindale, J. L. Hand, Pelham, J. A. Mandeville, Carrollton, and E. W. Swift, Columbus.

Legislative Committee: S. A. Carter, Atlanta, Fuller E. Callaway, LaGrange, G. B. Scott, Scottdale, P. B. Murphy, Newnan, and George W. Hamilton, Dalton.

Traffic Committee: H. P. Meikleham, Lindale, J. D. Massey, Columbus and C. V. Truitt, LaGrange.

Tariff Committee: Fuller E. Callaway, LaGrange, F. T Hardwick, Dalton and Allen F. Johnson, Atlanta.

The meeting then adjourned. Among those present and the mills they represented were

F. B. Gordon, Columbus Mfg. Co.
W. N. Banks, Grantville Hosiery Mills.
T. W. Raht, Swift Spinning Mills.
Chas. A. Sweet, Jr., Swift Mfg. Co.
D. W. Peabody, General Electric Co., Atlanta, Ga.
R. M. Harding, Columbus Power Co.
J. A. Mandeville, Mandeville Mills, Carrolton, Ga.
G. W. Hamilton, Crown Cotton Mills.
Roy Dallis, Unity Cotton Mills, Lagrange, Ga.
Saml. A. Carter, Gate City Cotton Mills.
W. C. Martin, Farish Stafford Co.
C. M. Young, Columbus Power Co.
Jno. S. Bleecker, Columbus Power Co.
H. P. Meikleham, Floyd Cotton Mills, Massachuestts Mills in Georgia and Trion Mfg. Co.
E. Darden Borders, Jno. E. Smith Cot. Mfg. Co.
E. W. Smith, Muscogee Mfg. Co.
Rogers W. Davis, Saco Lowell Shops.
W. J. Vereen, Moultrie Cotton Mills.
Edward Crusselle, Official reporter, Atlanta.
C. W. Chears, Traffic Mgr., Chattanooga.
Robt. Joerg, J. B. Holst Co.
E. P. Dismukes, Jr., Georgia Mfg. Co.
J. T. Broadbent, Meritas Mills.
W. H. Hazelwood, Universal Winding Co.
E. P. Dismukes, Georgia Mfg. Co.
M. J. Holden, Meritas Mills.
Harry S. Roberts, General Elec. Co.
L. L. Arnold, Editor COTTON, Atlanta.
M. C. Foster, Elk Cotton Mills.
G. K. Hutchins, Columbus Power Co.
R. D. Shapard, Georgia Cotton Mills.
Louis L. Jones, Canton Cotton Mills.
Geo. S. Harris, Lanett Cotton Mills.
W. M. Harris, Hampton Cotton Mills.
A. M. Henderson, Henderson Mfg. Co.
Jno. S. Roberts, Hamburger Cotton Mills.
A Pickens Wade, Muscogee Mfg. Co.
Jno. A. Mitchell, Hamburger Cotton Mills.
E. B. McWilliams, Waters Garland Co.
Jno. L. Davidson, Georgia Cotton Mills.
L. Lanier, Jr., West Point Mfg. Co.
Clifford Swift, Swift Spinning Mills.
H. L. Williams, Swift Mfg. Co.
L. W. Cuddy, Bibb Mfg. Co.
Robert Wilson, Eagle and Phenix Mills.
Clyde L. King, Georgia Cotton Mills.

Saturday morning at 10 o'clock all members and guests assembled by appointment at the union station where a special train was waiting to convey them to Goat Rock Dam as the guests of the Columbus Power Co. After an all too brief ride over a winding road and through pine woods, the land locked lake impounded by the dam came into view and brought with it thoughts of boating, fishing and bathing. These were entirely forgotten a few minutes later when the dam and power house were reached. It took some time to realize the "bigness" of the development. Standing on the top of the dam by the spillway, one could hardly realize that it was 1100 feet, more than a fifth of a mile, across that smooth stretch of water. It was not until later, when, under the leadership of J. S. Bleecker, C. M. Young and G. K. Hutchins of the Power Company, the visitors were piloted through the tunnel in the dam clear across to the Georgia side of the river, that they really understood the significance of that immense pile of concrete. Superintendent Young conducted the visitors over the power house proper, keeping, the while, a sharp look-out that nothing was thoughtlessly touched by those unaccustomed to 66000 volt juice. After photographs of the party had been made by the McCollum Studio, of Columbus, a representative of which accompanied the expedition, every one hastened back to the train where the buffet luncheon was served. Without a single exception appetites had been acquired equal only to those of boyhood days and many were the expressions of commendation showered upon Mr. Peters and others who had shared in superintending the preparation of the luncheon.

The "special" arrived in Columbus in time to connect with the afternoon trains, and the out of town visitors took advantage of these and mingled their adieus with hearty thanks for the royal entertainment provided.

Keep your eye on Griffin!

Courtesy of Southern Photo Material Co.

THE MASCOT.

THE COST OF LIVING

Its Relation to the Tariff; to Increased Gold Production; to Monopolies, and to Immigration. The Necessity of Making Our Population Conform to the Supply of Products Turned Out by Our Industries.

(*Contributed Exclusively to* COTTON)

BY WILLFORD I. KING, INSTRUCTOR IN POLITICAL ECONOMY, UNIVERSITY OF WISCONSIN.

In the February issue of COTTON, Mr. Simons effectively calls attention to the very considerable wastes under our present economic system. He freely criticises economists in general as abstract theorists unfamiliar with the facts upon which they base their theories. He charges me with quibbling on definitions merely for the sake of argument. I shall briefly reply to the last two points first.

As to the unreality of economic theory, I must beg leave to disagree with my honorable opponent but as I am a prejudiced witness my testimony may be discounted by the reader. It might be well, however, to call attention to the fact that present day economists make use of all reliable statistical information which they can find as a basis for a verification of their theories. The abstract deductive method is only one phase of economic reasoning at the present time and is constantly combined with the other method.

The proposal that the remedies for the defects of our present system must be worked out by the business man rather than by those who make a special study of these lines may not appeal strongly to the average citizen. The business man is too frequently the beneficiary of a bad system of wealth distribution to insure great activity on his part as a reformer. To expect the business man to reduce his immediate personal profits for the benefit of the social welfare would be akin to appointing a committee of university professors to consider plans for lowering the salaries of the teaching force of the institution. In neither case, would one anticipate great achievements. For reforms in the interest of the general public, we must normally look to those persons receiving no marked benefit from the condition of affairs which it is sought to remedy. For methods of scientific reform, we must depend upon the unprejudiced student of the special problem involved.

I dislike to be called upon to deny the assertion that I am insisting on accurate definitions merely for the sake of argument. Such a course is decidedly unworthy of a person engaged in a scientific discussion. The term "intrinsic value" is one which is so indefinite and misleading that economists have been compelled to discard it. If Mr. Simons should attempt to define it clearly, I feel sure that he would soon find that he had a very difficult task before him unless he made it synonomous with utility.

Economists have, by much discussion, discovered likewise, that it is impossible to say that the merchant is either more or less a producer than the farmer. Both merely add utility to certain objects and natural forces with which they work. The kinds of utility which they add are different but, from the point of view of the consumer of the final products, both render valuable services. The economist has learned by experience that, for accurate discussion, exact definitions are highly essential. Just how a term is defined is not of great importance, but uniform usage is very desirable and, when reasonable uniformity is once secured, it is unwise to depart therefrom without adequate cause. But enough for these preliminary points. The real question awaiting discussion is the cost living.

In this case, we at once come to the necessity of deciding upon a clear definition of terms before opening the discussion. What is "cost of living?" Does the phrase indicate how much money the average person spends in a given time? If so, it makes no difference as to whether prices are high or low. If a man spends $1,000, his cost of living is greater than that of the man who spends $800. Evidently this is not the meaning which the average man has in mind. In fact, the concept of the average man has been embodied in the definition worked out by economists. The economist defines cost as the amount of effort involved in producing the given article. Since it is impossible to statistically estimate the actual effort involved, it is usual to consider an hour's labor as the unit of cost.

If we are to compare "cost of living," it is essential that we compare the hours of labor in the same industry and occupation and also that we adopt some basis of the measurement of a "living." Evidently, only like things can be compared, hence the "living" in different times and places must consist of the same articles. If we are to compare the costs of living of working families, we must consider, therefore, the same class of workers at each place and period. We must imagine that they live in a house of the same quality, size, and convenience, wear clothes of equal utility and attractiveness, eat food of like nutritive qualities and equal palatability, live in houses which are equally well heated and lighted and that their provisions for sickness and their opportunities for recreation are practically the same in each instance. With these facts in mind, we are prepared to begin the real study of the problem.

We must next carefully differentiate between a high cost of living and a rising cost of living. The plateaus of Utah are higher in altitude than the mountains of the Appalachian regions but the former are level and the slopes of the latter are steep. The cost of living in a nation may be high and stationary, or low and rising rapidly. The two ideas are distinct.

The careful investigation made by the British Board of Trade recently as to wages and prices in different countries proves quite conclusively that the cost of living is much lower for the American workingman than for his British cousin, while the cost of living in Great Britain is considerably lower than in Germany; that is, for an hour's work, the wages of the American employee will

buy a larger supply of such commodities as he needs than he could obtain for a like amount of effort if he worked in a British establishment. Similarly, the German workman obtains less for an hour's work than the Britisher in the same occupation and very much less than the American similarly employed. The study of the British Board of Trade merely varifies the results as shown by many less complete investigations of a like nature. It is a thoroughly established fact that the cost of living is relatively low in the United States, Canada, and Australia and very high is such countries as India, China and Japan. True, prices are lower in the Orient than in America, but wages are very much lower in proportion.

It is proven beyond a doubt by abundant and reliable statistics that the cost of living of the workingman is much less today in the United States and in England than was the case a century ago; in fact it seems a reasonably safe assertion to say that it is today considerably less than half what it was a hundred years since. The workingman, like the other citizens, has shared in the prosperity brought about by invention, discovery and the organization of industry. The United States has been especially prosperous and the best data available indicate the cost of living to be not more than a third of what it was in the days of Washington and Jefferson. As measured by the standards of the past, the cost of living is very low. Whence then the present complaints of "high cost of living?"

These complaints are partially due to a change in our ideals and a rise in our standards of comfort. Prosperity has taught the American people to regard as necessities many articles indeed which our grandfather thought of only as decided luxuries. We now begin to complain because we cannot have dainty food in sanitary packages at the cost of the same efforts which formerly provided us with crude foods in bulk. We expect electric lights, furnaces and baths in our houses when formerly we were glad for a stove, a wood lot, a candle, and a tub of water. We shall never be completely satisfied. Doubtless it is not desirable that we should be, but we cannot correctly ascribe an increase in our standard of comfort to an increase in the cost of living.

We have come also to look forward to an abolition of poverty. We protest against low wages and privation. Formerly, these were regarded as inevitable. This demand for an increase in the well-being of the lowest stratum of the population has led us to inquire as to whether the present low cost of living may not be made still lower so that all may share in the general prosperity. It is this problem that has been at the bottom of the Socialist agitation. It is this problem which evidently is inspiring Mr. Simons in his present inquiry.

The Socialists have long pointed out the wastefulness of our present system of getting goods from the farms, the factories and the mines to the ultimate consumer. Dr. Clyde King's study has emphasized this waste. Professor Thomas W. Carver's recent investigation showed similar results. The facts are clear. There is tremendous waste and it is highly probable that a large share of this waste may be eliminated by improvements in the organization of commerce and industry. Whether this improvement will be by a development of the competitive system, by regulating monopoly or by the government entering into the industrial field more actively, is a question time alone can solve and upon which argument at the present time is likely to prove fruitless. The point that stands out is that the present cost of living may, by proper methods, be considerably reduced and that such a reduction is desirable if properly safeguarded.

During the last few years, we have noticed a very general and growing belief that the cost of living is rising. We found that the idea that the cost of living was really high was largely fallacious. Is the belief that it is rising likewise fallacy? This may be best determined by a reference to the statistics compiled by the United States Census and by the United States Bureau of Labor. According to these figures in the period between 1896 and 1910, hourly money wages rose approximately 31 per cent, while the prices of commodities consumed by the workingman increased 33 per cent. We see, therefore, a very slight increase in the cost of living during this period. The figures for the last two years are not yet available. The accuracy of the figures is not so great that we can even be certain that the cost of living has risen at all. We can,

WILLFORD I. KING.

however, be reasonably sure that it did not materially change in either direction between 1896 and 1910. This fact stands out in striking distinction to the long steady decline of the cost of living in the United States which characterized the preceding century and a half. Something has caused a change. What is responsible? The increasing prosperity of the American workingman has been checked. At whose feet shall we place the responsibility?

Mr. Simons believes that it is due to high costs of getting goods distributed to the consumer. Doubtless this cost is too high, but is there any reason to believe that it is higher than formerly? Do the railroads charge higher freight rates? The reverse is true. Do merchants and manufacturers receive a larger margin of profit than formerly? This remains to be proven.

Many persons believe the tariff to be responsible for the upward turn of the cost of living. The tariff today is a little if any higher than formerly. I have contended and I believe it to be true that a reduction in the tariff would somewhat, though not greatly, reduce the cost of

living. I see, however, no reason to believe that the tariff is in any way responsible for the cessation in the fall of the cost of living. The phenomena is the same in the low tariff England and high tariff Untied States, France and Germany.

The gold miner is charged by many with being the guilty party. He dug gold too rapidly and caused prices to rise. The last statement is no doubt true but increased gold supply means that wages will increase as much as prices though the time may be slightly delayed. Prof. Irving Fisher, of Yale, in his admirable work on The Purchasing Power of Money, has cleared up beautifully the whole question of the relation of money to prices, and we find in that volume no indication that the workingman is likely to be materially injured in the long run by rising prices.

The monopolist is the next person charged with the crime. Doubtless, the monopolists have grown in recent years and their profits have been deducted from the total national income before the distribution to the rest of society takes place. Every person not a stock-holder in a monopoly is likely to receive a little less income than he would if competition were free. The problem of monopoly is one of considerable moment and is increasing in importance. It is doubtful, however, if it is of primary significance in the question of the cost of living. Monopolies have saved in costs of production thus largely accounting for their increased profits. Profits due to economies place no added burden on the rest of society. Prices of monopoly products have soared skyward with nothing like the rapidity of prices of farm produce. For the real cause of an increase in the cost of living, we are, then, compelled to look further.

Professor Frank Fetter in the presidental address to the last meeting of the American Economic Association, as quoted in the Supplement to the American Economic Review for March 1913, brings out clearly the fundamental cause of the rising cost of living. It is the result of forces pointed out by Ricardo, Maltbus and Mill. The law of diminishing return is at work. Population is pressing upon the means of subsistence. The West no longer offers free fertile lands to all comers and, as a result, the price of food is advancing, affecting not only the United States, but Europe.

Whenever population increases faster than the land supply, wages tend to fall. Great density of population means less land per capita, less food per capita, less living room, less prosperity. In the United States, Canada, New Zealand, and Australia, population is comparatively scattered and real wages are high. In Germany, France and Italy, population is more dense and real wages are low. In Japan, India and China, population is overcrowded and wages are at the level of bare subsistence. After population reaches a certain density, more people means more poverty. The United States has passed this point, and as long as we leave open our ports to the floods of immigration from low-wage countries, just so long will our population increase rapidly and only marvelous progress in invention can keep real wages from falling. Immigration increases our population not only directly, but because of the high birth rate among the immigrants. It makes little difference how the immigrants are distributed, whether in country or in city, the more that come the harder will it be to maintain our present American standards.

Many wrtiers have wrongly assumed that the problem of immigration lies wholly in the supposed deterioration in the quality of immigrants arriving in this country. Paul Hourwich in a recent book has attempted to prove that the immigrant of today is of just as high a type and will make just as desirable a citizen as the immigrant of a generation ago. All this is beside the point. The immigrant may have all the virtues of our Puritan ancestors, but yet we do not desire his presence; not because we dislike the immigrant, but because America is already sufficiently peopled and hence to give freely to others means sacrifice for our nation. After all, "charity begins at home."

But it will be contended that this doctrine is narrow and selfish and forgetful of the duty owed to humanity at large. Such an attack is based on unsound logic. Immigration does not even help the nations from which the immigrants come. The pressure of population there is slightly lessened, the birth rate increases, the death rate decreases, and the same old conditions of poverty prevail. America has suffered. Europe has not gained.

The remedy then is evident. If we wish the cost of living to go on decreasing and general prosperity to keep on increasing as in the past century, we must limit our population so that we shall gain by invention and skill and not merely remain stationary, or worse yet, lose out in the race. With immigration shut out and the existing low American birth rate, we may anticipate a population soon becoming nearly stationary and a continued advance in the welfare of the masses of the American people. Without restrictions on the inflow of new-comers from over the sea, we can hope for nothing better than to see the American people slowly but surely reduced to an economic plane little if any higher than that of France or Germany.

The question of the cost of living then resolves itself into a study of the ways and means of making our population conform to the supply of products turned out by our industries each year. The future well-being of the nation must depend largely upon our immigration policy during the next quarter of a century. The preservation of our high standards demands prompt action. With immigrants shut out, the problem of the cost of living will gradually solve itself. With immigration continued in anything like the present proportions and the resulting rapid growth of population, the cost of living will continue indefinitely a burning issue in every campaign.

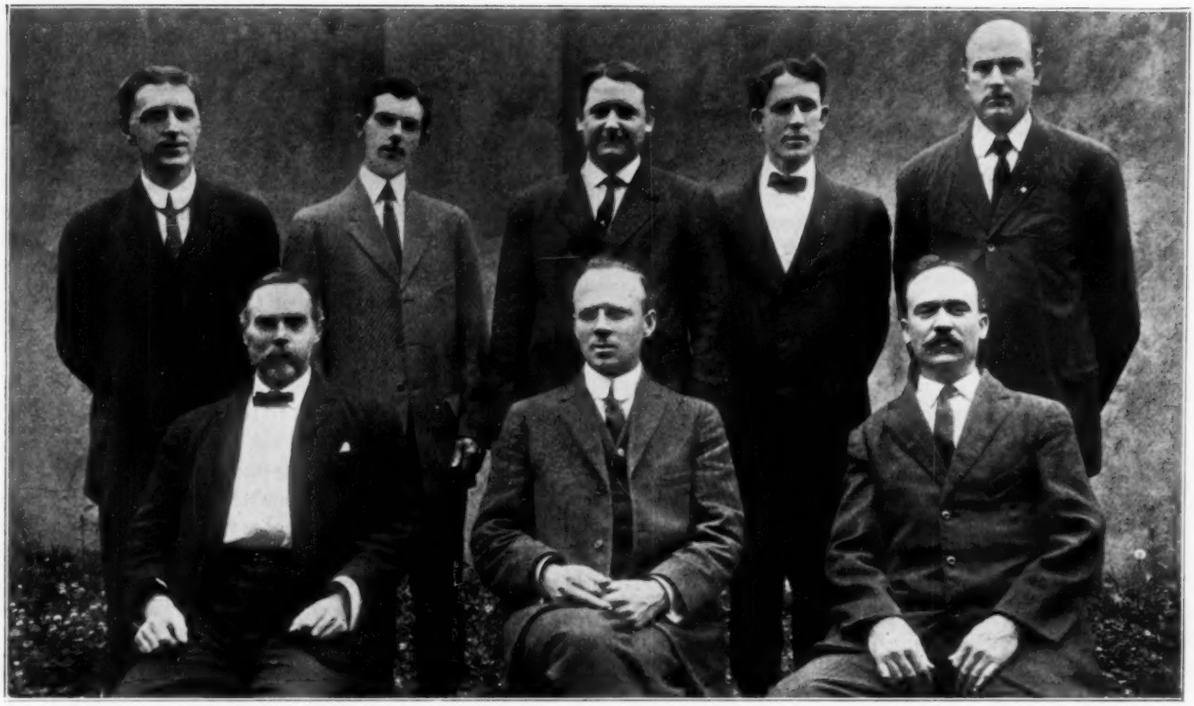
SOUTHERN TEXTILE ASSOCIATION.

Members of the Southern Textile Association should keep in mind the date, June 20 and 21, when the coming convention will be held at the Isle of Palms Hotel, Charleston, S. C. A search far and wide would not have revealed to the enterprising committee a more suitable place to hold a summer convention than the Isle of Palms. Serenely nestling among the chain of islands that skirt the Carolina coast, twelve miles from the historic city by the sea, Charleston, it has, year by year, grown in popular favor, until it has become recognized as one of the best known resorts in the South. The following is the program as outlined by the program committee:

The meeting will convene on Friday afternoon, June 20, at 2 o'clock, and the program will be as follows:

Address of welcome by the mayor of Charleston.

Response to the address of welcome by Capt. H. P. Meikleham, of Lindale, Ga.



OFFICERS AND DIRECTORS OF THE FULTON ATHLETIC AND SOCIAL CLUB.
SITTING, LEFT TO RIGHT: M. ANDERSON, TREAS; JAS. I. BRUSH, PRES.; P. A. SMITH, SEC. STANDING, LEFT TO RIGHT: W. G. BARTLETT, J. H. BAKER, ROBERT ADAMS, JNO. SMITH AND R. F. O'DELL.

Address of the president, T. M. McEntire.

Paper on "The Evolution of the Cotton Card," by Chas. Mills, consulting engineer, Saco-Lowell Shops, Boston.

Paper on "Increasing the Efficiency of the Operative," by David Clark, Charlotte, N. C.

Paper on a subject to be announced later, by S. W. Oliver, Columbia, S. C.

Paper on "The Weave Room," by R. J. Smith, Henrietta, N. C.

The annual election and business meeting will be held Friday night and followed by a smoker.

Saturday will be given over to pleasure and a boat has been chartered and all the members will be given a free trip out on the ocean with music and refreshments on board. Full details will be announced by the entertainment committee.

The entertainment committee announces that summer rates of two cents a mile will go into effect on June 1. These rates will effect all coupon stations. If a member not located at a coupon station wants this rate, he must make application to the ticket agent a few days in advance, and the agent at his point will get the ticket upon request. Members living at Greenville, Greensboro, Atlanta and other coupon stations, will secure the rate off-handed. Do not buy tickets to Charleston, but to Isle of Palms, S. C.

All expecting to attend will do the committee a favor by notifying either the chairman or secretary of the committee by mail, stating how many guests will accompany each individual. This action will greatly assist the committee in making their arrangements. Address, A. B. Carter, chairman, Athens, Ga., or W. P. Hamrick, secretary, Olympia Mills, Columbia, S. C.

FULTON ATHLETIC AND SOCIAL CLUB.

One of the most enthusiastic, entertaining and profitable social movements ever seen at a cotton mill was that held early in May for the purpose of organizing into one body all male employees of the Fulton Bag & Cotton Mills, at Atlanta, of 18 years of age, and over. There were about 300 present, and each one, at the conclusion of the meeting, seemed to be determined to make the "Fulton Athletic and Social Club," as it is to be called, a "howling success."

The business part of the meeting was disposed of in genuine business fashion, only requiring about 30 minutes for the election of all the officers for the ensuing year, and even the monotony of waiting for the nominating committee was broken by a reading by one of the girls, Miss Jessie Moon, who is particularly gifted as an elocutionist. Following the election of officers, President J. I. Brush thanked the members for the compliment paid him in brief, but happy manner. He was followed by Governor-elect Jno. M. Slaton, who made one of his characteristic speeches, dwelling at length on the importance of cooperation, and through it the possibilities that are open to all. The governor was made an honorary member of the club, and was very profuse in his thanks for the honor. The complete program follows:

Baritone solo, "If," by Jas. I. Brush.

Address, "Cooperation," by Gov.-Elect J. M. Slaton.

Comic song, "Stuttering Sweethearts," by Mr. Galloway.

Male quartette, "Evening Serenade," by Messrs. Gunthorp, Cowan, Johnson and Owens.

Soprano solo, "Rosalie," by Miss Lillian Ellison.

Reading, "Fresh Aigs," by Miss Jessie Moon.

Contralto solo, "Poem by Frank L. Stanton," by Mrs. Mamie Cunningham.

Song, "America," by the club.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

(*Special Correspondence*).

The North Carolina Cotton Manufacturers' Association, representing over two million spindles, met in Charlotte on the eighth day of May and went on record as strenuously opposing the cotton schedules of the Underwood bill. This was the principle matter before the convention, aside from the election of officers. C. E. Hutchison, of Mount Holly, N. C., was re-elected president and T. L. Black, of Charlotte, secretary and treasurer.

The resolution unanimously adopted and forwarded to the sub-committee of the Senate Finance Committee reads as follows:

"At a largely attended annual meeting of the North Carolina Manufacturers' Association now in session, representing over 300 mills, a resolution was unanimously adopted protesting against the drastic rates of the cotton schedule of the Underwood Tariff Bill, and asking your most earnest efforts to materially and greatly advance the rates of the said bill so as to enable us to continue to operate our mills.

"We are willing to abide by the decision of the democratic platform for a reasonable and gradual reduction; but we protest most vehemently against unjust rates, as embodied in the House bill, and we apply to you for justice."

Following the meeting and on May 26, President C. E. Hutchison, of the North Carolina Association, personally appeared before the sub-committee of the Senate Finance Committee in Washington, in support of the above resolution, and plead for an increase in rates of at least five points. Mr. Hutchison made a strong appeal. He did not make the mistake of telling the committee that all Southern mills were headed towards bankruptcy unless his petition was granted, but he gave reasons why it should be granted in justice to the millions of dollars invested in manufacturing cotton yarns.

Replying to a statement of Lewis W. Parker, former president of the American Cotton Manufacturers' Association, in which Mr. Parker had asked for a raise of tariff rates of 2½ per cent. Mr. Hutchison said that Mr. Parker was a cloth man and could not speak authoritatively for the yarn men. "Mr. Parker has repeatedly pointed out," said he, "that the duty on yarns in the Underwood Bill was too low, but he probably thought that a two and one-half per cent raise was all that could be secured at this time. We feel that the raise should be five points on all grades of yarns. We all realize this whole proposition is an experiment, as no one can tell with any degree of accuracy just how the bill will affect manufacturers; but if we are to err, it is better to err on the safe side. If you recommend a raise of five points on the House bill and it is found later that we can stand a greater reduction, the lower rates may then be applied."

Mr. Hutchison insisted that yarns were as much of a finished product as is cloth, since they were used for weaving and knitting fabrics. "Yarns are subject to even more critical examination than woven fabrics," he continued, "and any slight imperfections are more easily observed. It is impossible for us to manufacture as cheaply as foreign countries; for our higher wage scale has produced in the United States a higher standard of citizenship among the working classes than in any other country of the world."

Speaking on the subject of efficiency, about which Secretary Redfield has had much to say, Mr. Hutchison told the committee:

"It has been said the way to meet the reduced cost of manufacturing goods so that we can compete with Europe, Japan and other countries, is to teach our operatives greater efficiency. We do not doubt the sincerity of those making these statements, but when applied to the manufacture of yarns, it is not altogether tenable. All machinery in cotton mills is regulated to run at a uniform speed to get the best results. An operative, after becoming familiar with his machines, knows their maximum capacity, and that their speed cannot be increased or reduced at will, but their efficiency stops at a given point. The textile industry is different in this respect from others, where skill and physical endurance play an important part."

Another important meeting of mill men held in Charlotte during the past month was that of the Southern Hard Yarn Spinners' Association. The sessions were held behind closed doors and very little of the proceedings was made known. The meeting was largely attended, and one matter given particular attention was that of selling arrangements.

A final appeal was made by Georgia mill men, when Fred B. Gordon, J. D. Massey and other members of the Georgia Cotton Manufacturers' Association appeared before the sub-committee of the Senate Finance Committee at Washington.

Mr. Gordon told the committee that there were 130 cloth and yarn mills in Georgia, capitalized at $34,621,000; knit goods manufacturers, whose combined capital was $794,000, and four woolen mills, having $500,000 capital, which would be affected by the reduction on textiles. The mill men are particularly anxious that a greater distinction be drawn between the grays and colored goods and on the plied combed and finished yarns, and on the mercerized and fancy weaves of cloth as compared to the plain cloth weaves.

Mr. Gordon said he was in favor of a tariff for revenue, but he wanted reductions to be brought about gradually.

"Don't listen to political sentiment," he said. "Listen to common sense, everyday facts. Who appeals to you? Every Southern lad with a cotton hoe in his hand, every Southern boy attending an agricultural college, every crossroads cotton gin, every Southern community which by popular subscription has built a 5,000 or 10,000 spindle yarn mill, to which has been subscribed the hard earnings of the neighboring farmers and the widows of the county, looking for a safe investment."

A coming meeting of importance will be that of the South Carolina Cotton Manufacturers' Association at Lake Toxaway, N. C., on July 2, 3 and 4.

The cotton mills of South Carolina will be assessed for taxation during 1913 on a spindle basis instead of on the market value of their capital stock, as has been the case heretofore. The state board of equalization adopted the spindle basis plan on the recommendation of its cotton mill committee, made May 7. The plan has been strenuously

opposed by J. G. Courtney, who offered a resolution rescinding the order. In a lengthy statement he showed the difference of cost in various mills, computed on the spindle basis, citing two new mills where the difference would be over four dollars per spindle.

Despite gloomy predictions of eventualities resulting from dissected tariff schedules, there has been little curtailment among Southern cotton mills. The majority of mills are making full time. A hand to mouth policy is observed by many mills. Goods are not allowed to accumulate, but are manufactured as orders are placed.

During the past month several new mills have been incorporated and extensive improvements of established plants have been reported.

NEW ENGLAND MILL SITUATION.

(*Special Correspondence*).

The closing of the Fall River Iron Works mills on May 12 was followed by a manifestation of greater strength in the cotton goods market which has been maintained and now promises to carry through the uncertain period of tariff revision. The reason assigned for the closing of this large print cloth plant was that goods were selling in the markets below the cost of production. Although the announcement was made that the mills would be closed for an indefinite period it is well understood that if the present outlook for sales is continued the mills will not remain long in idleness.

Print cloths and wide convertibles had fallen in value a full ½ cent a yard from the first of the year. The recovery since the middle of the month has been about one-half the loss or ¼ cent a yard. The weakness is those goods had begun to bring down the values of sheetings, drills, and other goods, although no great accumulations of stocks existed anywhere. Now that the turn upward has occurred, it is believed that it will continue to be felt in all lines. No sustained movement upward is looked for while the uncertainty of tariff revision hangs over trade and while many of the cloths may not be interfered with by any legislation now proposed, the indirect effect of a revaluation of merchandise to follow tariff revision downward may become very serious and difficult to adjust.

During the month the New England cotton manufacturers took hold of the tariff situation in a stronger way than they have shown at any time in the past four years of tariff talk. One consequence thus far has been the arousing of political interest among legislators committed to a revision downward to the extent that has forced them to see that if a mal-adjustment of textile schedules is provided for the effect may be very far-reaching and even disastrous in other than manufacturing centers.

It is believed at this time that the gross inequality of treatment accorded ginghams and other colored yarn goods in the Underwood bill as it was reported from the House of Representatives will be remedied. A brief on the subject submitted by the Amoskeag Manufacturing Company called the attention of the trade as well as the legislators to the ill-considered revisions provided for in the Underwood bill affecting cloths that are now widely popular with the masses of people. It was shown, incidentally, that the fallacy of the Underwood bill being called a measure designed to benefit Southern cotton mills at the expense of Western mills was more important than it seemed to be, for it was not a matter that had foundation when all the facts were made known.

Should the Underwood bill become law as it was originally written it would completely disorganize the colored goods business of the country. It is now understood among New England manufacturers that the chemical schedule will not contain the provisions that would tax the dyestuffs that are raw materials for so many cotton mills, and it is also firmly believed that when the Senate bill is reported it will contain provisions that will make the tariff relations of ginghams and gray goods substantially what they should be, based upon the conversion costs of each as determined by the Tariff Board and by the common experience of all manufacturers having any experience with the higher costs of production in yarn dyed as against gray yarn goods.

The question of whether the fine and fancy goods industry will secure the same relative measure of tariff rating provided in the Dingley and McKinley bills is still unanswered. Some modifications of the jacquard figured goods is promised, but of the total loomage in the country, only 2 per cent or less is made up of jacquard attachments so that concessions in this respect will be more important in merchandising than in manufacturing, the foreign mills having a large bulk of jacquard equipment compared with the loomage in this country.

While there is still a great deal of apprehension in New England concerning the tariff, it is true that there is less of it than there was a month or two ago. One cause for this is that it is fully believed that if the Underwood bill as reported is enacted it will bring about a very quick revulsion against the dominant party as the consequences of the textile schedule revisions will be felt early and adversely in all parts of the country and in dry goods stores. Those who are engaged in the work of revising the Underwood bill in the Senate Finance Committee have assured New England manufacturers that at least several suggested modifications in the cotton schedules will be reported, and it is thought possible that the wool industry will not finally be forced to resist such a shock as the one is that must follow the Underwood revision as now planned.

The business done in print cloth yarn goods and convertibles has been sufficient to give the mills work enough in June to prevent accumulations of any kind. Stocks of all kinds of goods at Fall River are less than 850,000 pieces, which distributed among 90 mills, is nominal. Staple printed goods have not changed in price despite the long seige of low prices for gray cloths. Sales are being made in moderate quantities and printers are not piling up stocks. There is considerable curtailment in printings due to shutting down of machinery, but nearly all the print works are running half or more of the machinery.

There is a good business offered on printed crepes, voiles, and some of the fancy novelties, but there is a dearth of business on printed batistes, lawns, organdies, and similar goods. The trade in percale and shirtings has been all ranges of price and on all classes of materials. There has also been a large business booked on printed draperies in all ranges of price and on all classes of materials. This has enabled works like the Pacific and Arnold to keep running steadily.

Beyond the notification a month ago that at least a ¼ cent a yard reduction would be made upon bleached muslins ordered on memorandum there has been no formal announcement of lower bleached goods prices. There has

been more or less trading off on unbranded goods. The lowest touched on the best grades of 4-4 64s was 5⅞ cents and they are quoted today at 6 cents. The bleachers have sold about half their output during the month on day to day orders and because of deliveries on old orders they have not accumulated much merchandise. They feel confident that when jobbers begin to come in next month there will be no need of reducing prices to the levels suggested when the memorandum orders were invited.

The Amoskeag Manufacturing Company made a price of 6½ cents net on the 32-inch chambray it has been making for the past two years and in a single week it booked 8,000 cases. It also made a price of 6½ cents on a 32-inch bleached madras for the manufacturing trades. This cloth is new and has already received a most encouraging reception. Action on these goods has stirred up more business on yarn dyed fabrics for the cutting and jobbing trades but it has not done much to stimulate ginghams. Staple ginghams are well sold for the next 30 to 60 days, but the dress ginghams reorders have been light. The trend is strongly toward 32-inch dress ginghams to take the place of the narrow goods that have been the chief production hitherto.

An advance of ¼ cent a yard was made on Hill 4-4 bleached jeans during the month and it was announced that sales have been large enough to take care of a full output for 60 days to come. The fall business on quilts has been of good volume on satin constructions, but business on the low end has been indifferent. The Monument and Bates lines are comfortably sold. Over 4,500 cases of Stark crashes have been sold for fall at an advance of ¼ cent a yard over the figures of last season. On colored duck and heavy working suit goods mills are still sold ahead for some time yet.

Apprehension, and a restricted product, are still the features in fine and fancy cotton centers. Business is not being sought beyond September, although spring orders should have been placed long before now. There are several orders in on extreme novelties and fancies such as fancy ratines, fancy crepes, fancy voiles, and certain lines of high specialties in shirtings and dress cottons. But the great bulk of business on staples and semi-staple in combed yarn is wanting and will not be encouraged until something more definite is known as to what will be done with the tariff.

In machinery circles there is business enough in hand but there is very little encouragement to complete it. In fact, some of the large works are holding back business until the tariff matter is out of the way. Should some of the changes suggested be made, it is certain that several orders on the books will be cancelled and the business may not be placed elsewhere. It is the feeling among machinery men that the proposed bill will restrict manufacturing expansion for at least three years.

The bleacheries and dyeing and finishing establishments have been curtailing. It is announced that the Passaic branch of the U. S. Finishing Company will be closed June 1 and the work will be transferred to the New England branches. Many prominent changes in personnel are going on in this concern. A committee of stockholders is expected to be appointed shortly to act with a committee of creditors to bring about a reorganization.

Throughout the New England district it is the impression of manufacturers that business may hold fairly steady for two or three months yet, but they are disinclined to expand, or to encourage late business that may be subject to entirely new conditions when the Washington legislators have completed their present labors.

COTTON CROP CONDITIONS AND A REVIEW OF THE MARKET.

(*Contributed Exclusively to* COTTON).

BY H. AND B. BEER, NEW ORLEANS.

It being fully realized that there is more than enough of old crop cotton to go around this season, the undertone of the market has been easier as a rule during the past month, and, as a result, values are somewhat lower than they were at this time one month ago.

Thus far this season there has been marketed 13,105,000 bales, against 15,250,000 bales for the same period last season, but there is more cotton than at this time one year ago in the South to market, probably over 1,000,000 bales compared with 888,000.

There has been considerable disappointment over the failure of the trade demand to improve as a result of the close of the Balkan war, sales of cloth and yarn in Manchester showing no improvement, while sales of spot cotton at Liverpool have been very small, even for this time of the year.

Stocks at the 30 counted towns in the South are very large for this period of the season, 366,000 bales, compared with 247,000 one year ago, and these holdings reflect large stocks at the uncounted towns. We have advised against the holding any longer of this large quantity of cotton in the South for higher prices, for if the weather remains favorable for the new crop, chances are that lower prices, perhaps much lower, might be witnessed.

The present level of values is high comparatively, even when compared with last year, 12 5/16 for middling, against 11 5/8. The trade demand is not good, and as every day brings us closer to the maturity of the new crop in the early producing sections of the belt, it is more than a speculative risk to hold spot cotton under the circumstances, especially when new crop cotton, October delivery, is offered around the 11-cent level. Contrary to the general idea, this crop has had a normal start, and is earlier than last year over the greater portion of the early producing districts of the southern half of the belt.

The weather has been favorable on the whole for the new crop, especially in Texas, Oklahoma and the Mississippi Valley states, and while dry weather has been complained of in Alabama and the South Atlantic states, good rains have been had of late in all sections east of the Mississippi river. As a result, crop prospects at the moment could hardly be improved upon, dry weather having been relieved by rains, low temperatures by warmer weather.

Never before at this time of the year were prospects for a new crop more favorable than they are today in Texas and Oklahoma. Both states have had an abundance of rain, the western portions, where it will do the most good, having received the lion's share of the moisture, thus assuring a large yield if anything like occasional rains are had during the summer months.

As regards the acreage, the increase is general in all sections of the cotton region, but more particularly in the Southwest, although the area planted to cotton in South Louisiana and Southern Mississippi will be much larger

than one year ago, as the weevils seem to be less numerous; no reports of any being seen as yet in this section of the belt, which is rather significant.

The best crop reports come from the sections where the increase in the acreage is largest, from Texas, Oklahoma, Arkansas, Louisiana, Tennessee and Mississippi, in order named, though advices from Alabama and the South Atlantic states are gradually improving. A little more rain over the eastern portion of the belt would place the new crop in the pink of condition.

Visible stocks of the world are large, of all kinds of cotton are 4,463,000 bales, which is almost as large as they were last year at this time—4,482,000 bales. Of this amount there is of American cotton 2,964,000 bales, against 3,314,000 last year. Spinners' takings of American cotton by the world thus far this season have only been 11,493,000 bales, to even date, while last year they were 12,726,000 bales.

WILLIAM RAY & Co., of New York, report that the general conditions in the cotton market remain unchanged. The textile trade is upset by the tariff. Speculation loading up in the new crop on the hope of some damage later and also on the very bullish information from Liverpool.

The crop has so far received no serious set-back. There appears to be some cotton unsold in the South, which awaits a possible twist of July shorts, as that is the only hope of relief, manufacturers having already secured their stock for balance the season.

There is a general slowing down of all business, confidence is not strong; financial restraints and government interference with business enterprises, are at present more controlling factors than the usual question of supply and demand.

THE KNIT GOODS MARKET.

The knit goods market for the past month still continued to reflect the large business of the earlier months of the year. When the month opened, it found underwear manufacturers in a good position as far as orders were concerned and practically all the mills that made light weights were sold up on production for the season. Selling agents reported that the demand for light weight underwear continued and they looked upon it as a good sign for the next season. Some cancellations of high-grade heavyweights were reported earlier in the season, but at this time it was said that many new orders had put most of the mills in a strong position. Some of the heavyweight mills were reported to be practically out of the market for the fact that they were entirely booked for the season. Warm weather moved summer underwear and many urgent requests were received from jobbers looking for immediate deliveries. The hosiery situation also opened up and duplicates of light summer hosiery came in very strongly.

As the month wore on, the report was circulated through the underwear trade that one important line of the cheaper balbriggans was opened for business for next spring and much interest was felt along these lines. The meeting of the New York State Manufacturers at Utica seemed to indicate that they would be ready to consider operating after July 1, and that they expected prices to be on about the same basis as last year. Tariff changes were a subject of discussion to a large extent. Stocks were considered to be very low, the balance between production and consumption having been nicely maintained this year. Hosiery prices were advanced on one or two classes for spring, 1914, showing a difference of about 5 cents on goods selling around $1.00 a dozen and 2½ cents on goods selling around 65 to 70 cents. Prominent manufacturers of the higher priced fashioned hosiery stated that they were not decided as to what to do for next spring. The tariff and the unsettled labor conditions made it impossible for them to name prices with any degree of certainty.

As the month closes jobbers begin to move on fall requirements and many staple goods are called for for both nearby and forward delivery. Uncertainty still surrounds the opening for the spring, 1914, sales of underwear and agents and manufacturers state that it will be impossible for them to make prices until later. Anything above $1.75 a dozen for 25-cent balbriggan lines did not meet with the buyers' approval and this is probably one of the reasons why no opening date was named at the knitters' meeting. Numerous duplicate orders have been received for nearby delivery of lightweight goods and also for fall delivery of heavyweight. There has been some inquiry in the market for fall and winter goods in the hosiery line, but nothing of any size has as yet developed. The final result of the knit goods situation will probably hinge largely on the final tariff bill as signed by the president and also on the condition of the raw cotton and yarn markets.

THE YARN MARKET.

Cotton yarns for the past month have been irregular, both in price and trading, but the month as a whole had a slowly improving tone in the demands of buyers. The month of April closed with a pessimistic feel among dealers in yarns and business was very spotty. While some manufacturers bought, others in the same line did not. The tariff was the bone of contention over which the different buyers and dealers disagreed. Some believed that the tariff, as proposed, would afford ample protection, while others were certain that it would close many American mills. The underwear trade was in a good condition and many of the mills sold up. The demand for light weights continued and carded hosiery manufacturers were reported to have plenty of business. Southern frame spun 24's carded cones were not plentiful and there was also a scarcity of 14's cones. Weavers generally were believers in low prices, but the lack of confidence was the great depressing factor.

The opening of May found prices soft in many places. A spirit of conservatism still prevailed and tariff talk was having a depressing effect. Many spinners, however, were well ahead with orders and were disposing of their product as soon as made. This is particularly true of several Southern mills. New York markets seemed to be the center of pessimism and manufacturers who visited that city returned feeling uncertain as to the future. All the manufacturers and dealers were not in such a pessimistic mood, however, and many believed that the conditions which prevailed in the fine goods market did not exist in others. The crop prospects are believed to be excellent and a good business is looked forward to next fall and winter. In the opinion of many men the money situation is of more importance than the tariff in many respects. There was a light demand for combed yarns with prices comparatively soft.

As the month wore on cotton yarn sales remained small, but the demand was more general and prices seemed to be somewhat firmer in the weaving counts. A great deal of

misinformation has been disseminated about the tariff, and the effect of such talk has been felt practically during the entire month in the yarn market. The knitting yarn end of the market seemed to be in better shape than was the case in the weaving. Knitters were still busy with spring orders and managing to use up fair quantities in completing their light weight lines.

The close of the month found underwear manufacturers in the market for spot yarns, some numbers being comparatively scarce. Dealers were pushing sales for future delivery and meeting with fair success. There was a brisk demand for 24's Southern frame spun cones, in quantities ranging from 5 to 20 cases for spot delivery. Sales were made at 24 to 24½ cents. 10's, 12's, 14's and 24's are all scarce for spot delivery. Combed yarns are quiet and while there was a few sales of from 20,000 to 50,000 pounds of single combed peeler, to hosiery and underwear manufacturers, the great majority of sales consisted of a few packages for prompt delivery. There seemed to be hardly any demand for 60's two-ply and finer. A sale of 70's two-ply was made at 63 cents and 60's two-ply for 53 cents, while others asked 66 and 67 cents for 70's, and 55 cents for 60's two-ply. There is little demand for mercerized yarns, the latest quotations being 36's two-ply at 51 cents, 40's two-ply at 53 cents, 50's two-ply at 58 and 59 cents. There were some sales of 60's two-ply at 68 cents and 70 cents and 70's two-ply at 80 and 82 cents. Weavers are buying from hand to mouth, and while fairly well engaged, decline to buy for future delivery on any large scale. While the tariff is still a depressing factor and will probably continue to be so until the proposed law is definitely settled one way or another, the reports from the Senate Finance Committee and the fact that they are sending out further questions regarding different schedules, are tending to make manufacturers believe that some items of the schedule may be revised to a more favorable point than was indicated when the bill passed the house.

Following are recent quotations in the Philadelphia market:

Southern Single Skeins.

4s to 8s	18½@19	16s	20½@21
10s	19 @19½	20s	20½@21
12s	19½@20	26s	23
14s	20½	30s	24½@25

Southern Two-Ply Skeins.

8s	18½	24s	23 @23½
10s	19 @19½	26s	23½@24
12s	20½	30s	25
14s	20 @20½	40s	30 @31
16s	20 @20½	50s	41 @42
20s	21¾@22	60s	52

Carpet and Upholstery Yarns in Skeins.

8-4 slack	20½	8-3-4 hard twist	18 @18½
9-4 slack	19½		

Southen Single Warps.

8s	19½	20s	20½@21
10s	20	24s	23
12s	20 @20½	26s	23½
14s	20½	30s	24½@25
16s	20½@21	40s	30

Southern Two-Ply Warps.

8s	19½	24s	23½@24
10s	20	26s	24½
12s	20½	30s	24 @25
14s	21 @21½	40s	30 @31½
16s	21½@22	50s	42
20s	21¾@22		

Northern Two-Ply Carded Peeler Skeins.

20s	25	36s	33
22s	25½	40s	35 @36
24s	26	50s	44
26s	26½@27	60s	49 @50
30s	27½@28		

Two-Ply Combed Peeler Skeins.

20s	29½	50s	45 @48
24s	31	60s	55 @56
30s	34 @35	70s	63 @65
40s	39 @41	80s	70 @74

Single Combed Peeler Skeins.

20s	29	40s	39 @40
24s	30	50s	45 @46
30s	34	60s	53 @55

Southern Frame Spun Yarn on Cones.

8s	19 @19½	18s	22 @22½
10s	19½@20½	20s	22 @23
12s	21 @22	24s	22 @24½
14s	21 @21½	26s	22½@25
16s	21½@22	30s	25 @25½

COTTON MANUFACTURING.

STARTING UP FANCY DOBBY WARPS.

SELECTING THE HEDDLES—LENGTH OF THE HEDDLES—PREPARING THE SHAFTS AND HEDDLES—POINTS FOR THE LOOM FIXER.

(*Contributed Exclusively to* COTTON.)

BY THOMAS NELSON.

There are in general use three kinds of heddles, *viz.*, the wire heddle, the German tinned heddle, and the flat steel heddle. Up to a few years ago the wire heddle was about the only heddle used, but in the past few years a considerable quantity of the last named heddles have been introduced.

The wire heddle is made from one continuous piece of wire. The wire is cut the right length, then bent in the middle to form two ends. The heddle rod holes are formed and the two ends twisted together to make the eye, both at the bottom and at the top of the eye. A twisted end is left at the top of the heddle.

The German tinned heddle is often referred to as the soldered heddle, because the two pieces of wire that form the heddle are soldered together.

The flat steel heddle is made from a flat piece of steel with the heddle rod holes and the eye punched out of the flat steel wire.

The question is very often asked as to which is the best heddle to use. The answer to this question can only be given in a general way, since each individual user will have his personal preference. A comparison, however, of the two heddles which are nearest alike, the wire heddle and the German tinned heddle, with a few remarks about each, can be given in answer to the question asked above.

Take the wire heddle. This is the cheaper of the two heddles mentioned, which is often a deciding factor in its favor. Good results can be obtained from this heddle providing the counts of the wire used for the heddle is not too heavy for the size of yarn being woven. If the wire is too heavy, the twists at the eye have a harsh effect on the yarn and frequently cause breakages. One disadvantage of this heddle is that the eye is not exactly in the middle of the heddle. The result of this is, that if a few heddles should be put on a harness shaft different from the others, the ends which these inverted heddles carry would hang low in the shed. This would be the case, especially if these ends passed under the back rod and over the front, for the tension would be put on the ends at the back rod. These heddles also have a tendency to wear at the eye of the heddle at the point of twist in the eye. When this wearing of the eye does occur, it will be economy to throw the heddle away at once. This wearing takes the form of a ridge made by the end coming in contact with the heddle at that point

all the time when the end is being carried up and down by the heddle. Extreme care is also required with these heddles to prevent rusting. If the heddles ever become rusty, they very soon lose their value.

Very much can be said in favor of the German tinned heddle. In the first place, they are smoother, and this fact alone is worth considering, as it reduces friction on the yarn to a minimum. In fact, this is one of the strongest points of this heddle. The eye is in the center and the heddle is put on the shaft correctly, whichever end is put on top. They are more expensive than the wire heddle in first cost, but the writer believes that this extra initial cost is soon regained by better weaving. Of course, the right counts of heddle will have to be used or the best results cannot be obtained. A heavy wire would not be used on fine yarns, neither would a fine wire be suitable on coarse yarns. In the first case, the heddles would be hard on the yarn, while in the last case, the yarn would be too strong for the heddles and would cause them to bend.

The flat steel heddle stands in a class by itself. This heddle is made from a flat strip of steel with the heddle rod holes and the eye punched in the wire. The eye, however, is not simply punched in the flat steel, as this would leave nothing but an oblong hole for the eye. This was the way in which the first heddles of this class were made, but since that time a gradual development has taken place in the manufacture of them. The eye is cut in the flat steel and then shaped, which gives a good weaving heddle. The latest heddles of this class are made with an offset in them so that they can be brought closer together on the shaft. This is an improvement over the former heddle. Care, however, is required when making up new sets of harness shafts, for if by any chance the heddles should slip off the rods and become mixed together, considerable time would be required to get them straightened out again. This, however, is not likely to happen with a careful handler of the heddles.

It was at one time considered that a ten-inch heddle was large enough to weave cotton goods, and that anything larger than this was but an additional and uncalled for expense. There seems, however, to be a change along this line; in fact, it can be stated that the twelve-inch heddle is so much superior to the ten-inch that wherever they are once used, their continuance is almost assured. The cost of twelve-inch heddles is of course more than for the ten-inch heddle, and in mills where the latter heddle is used it would be expensive to throw away all the heddles on hand in order to use the large heddle. However, where new heddles and heddle shafts have to be purchased, the writer believes that it will more than repay the mill to buy the larger size.

The main advantage of the large heddle is that the weaver is allowed more space to work when drawing ends through the heddles or when ends get tangled in the heddle eyes. The advantage of this can very readily be seen. The extra space allowed also enables the weaver to more clearly see in between the heddles and detect more readily any loose or broken ends in the heddles. Anything that relieves the weaver of work or makes the work easier, is a decided gain, since in a cloth mill the output of the weave room is the deciding factor. It is the little things that count.

To prepare the harness shafts and heddles for the drawing-in hand and the weaver is the correct way and to have these heddles and shafts so fixed that the best results will be obtained should be the aim of the person responsible for this work. A few remarks, therefore, on the preparation of heddles and shafts may be of service. In the first place, the heddles should always be clean and should not be rusty. The heddle rods should also be kept free from rust and should have a little oil or oil and tallow mixed, rubbed on them so that the heddles will move about freely. If the heddle rod hooks hold the heddle rods too far apart the heddles will be held tight with the result that they will not move freely and the best results are not obtained. For example, when a weaver draws an end through a heddle eye, the heddles are moved back on each side of the empty heddle as the weaver is drawing in the broken end. Ordinarily, after drawing in the end, the weaver will start up the loom immediately and the heddles, which have been pushed out of place, will at once slip back to their regular and correct position, that is, if the heddles are working freely on the heddle rods. If the heddles are not working freely on the heddle rods, they will not at once slip back to their correct position, often resulting in other ends breaking out because of the heddles being out of place. Under such circumstances the weaver will have to push the heddles back to the correct position after drawing in the end, before starting up the loom. This causes a loss of time, and although it is but a very small amount of time, still, this little time could have been saved and better results would have been obtained by the small amount of attention necessarily given to this point before the harness were put in the loom.

If the heddles have the twisted ends, these should all be put on one way, either all at the bottom or all at the top; they should not be mixed. The heddles should not be mixed on any one shaft, that is, the same counts of heddle should always be used together. A coarse heddle and a fine one should not be used on the same shaft.

On the majority of harness shafts, the heddle rods are fastened on each end outside the shaft by a little wire catch which fits in a hole on the end of the rod. Before starting up the work, it is absolutely necessary to see that these catches are fixed right. The writer has seen many cases where the catch would slip out of the rod and the rod would work out of the frame, with the result that the heddles at the end would eventually get into the yarn and make a smash. Now, if there is any one thing that troubles and worries a weaver more than another it is a smash of any kind and especially one that could have been avoided.

Another point which will help the fixer, perhaps more than the weaver, is to have all the heddle rod hooks facing the front. When a new warp is put in the loom the fixer has to divide the ends so that the heddles will be straight at all parts. When dividing the heddles, it is easier to make the change with all the hooks facing the front rather than facing the back. In any case they should not be mixed up, that is, some facing the front, others facing the back, it will not effect the weaving of the cloth, but will make the work of the fixer a little harder at the starting up of the warp, and for this reason they should all be facing one way, and the best way is toward the front.

Japan is a large importer of cotton from the United States, but the figures of 1912 far exceed those of any earlier year, our own trade figures showing exports of cotton to Japan in the calendar year 1912 amounting to over 209 million pounds, against 142 million in 1911, the high record calendar year in cotton movements to that country. The total exports from the United States to Japan in 1912 were 58 million dollars in value, against 44 million dollars in 1911.

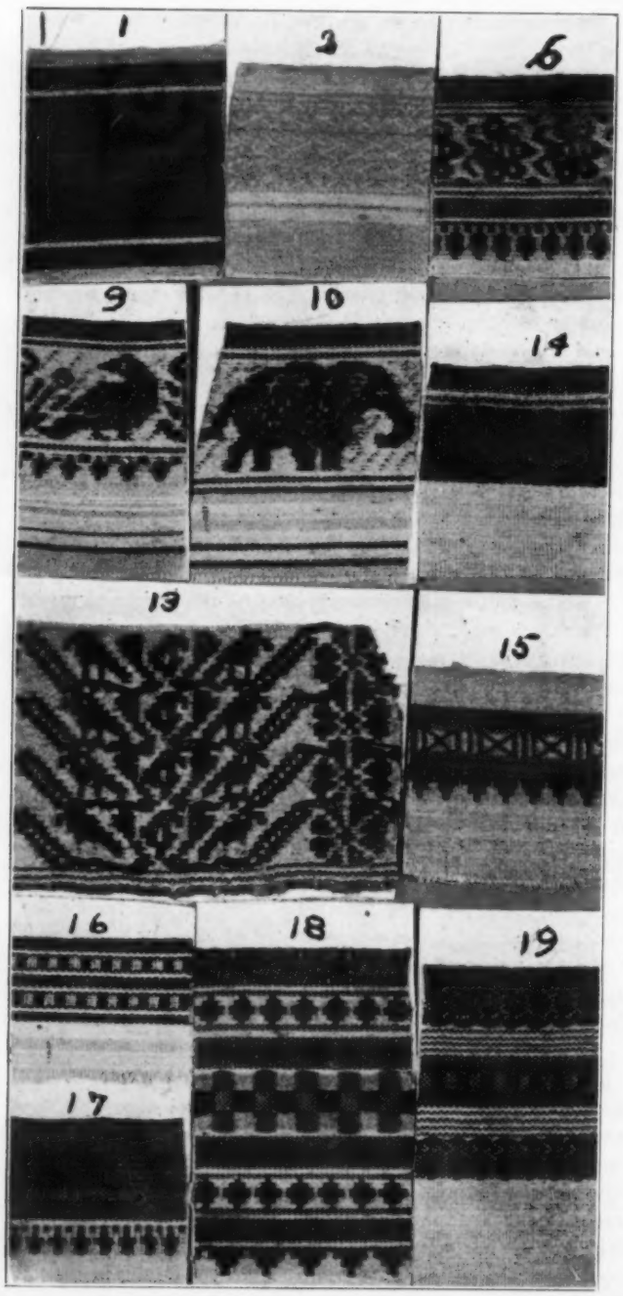
THE MANUFACTURE OF DHOOTIC BORDERS.

(Contributed Exclusively to COTTON*)*

BY MILES R. WHITHAM.

Dhooties are a class of cloths expressly manufactured for the British Indian market in large quantities by the manufacturers of Blackburn (Lancashire) and district. This trade is of an extensive character since practically every male Hindoo wears a dhootie for a loin cloth. The use to which these cloths are put, to a certain extent limits their size and dhooties range from 20 to 50 inches in width and from two to five yards in length.

The chief characteristic of all dhooties lies in the border woven in at each side. These borders range from simple stripings of "crammed" bleached yarn in what are termed



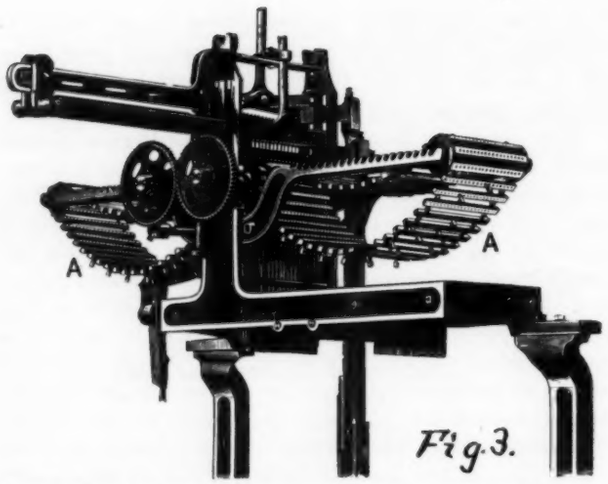


Fig. 3.

"grey" dhooties, to the most elaborate colored and ornamented borders on the colored dhooties. In general the body of the cloth is developed in grey yarn, whilst borders of bleached and colored yarns give a good contrast, especially in view of the fact that the ground cloth is of a fairly light texture and the borders are heavily "crammed" as extra warp in the denting.

For grey dhooties the borders are of white yarn arranged in the form of cords, which weave quite plain like the body of the cloth, or stripes of various widths of white yarn "crammed" in the reed alternately with the ground. Sometimes colored threads are introduced which are also arranged to weave plain similar to that shown at Fig. 1, which is a border containing white, black, red and yellow stripings, on a grey back cloth. Fig. 2 shows a grey dhootie with a border developed in coarse twofold yarns as a diamond effect.

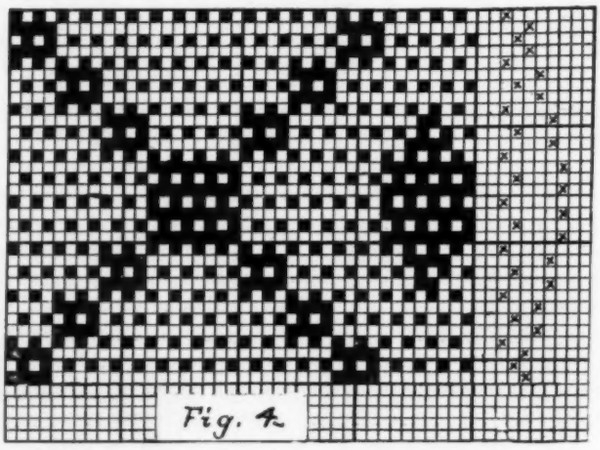


Fig. 4.

It is, however, in the figured dhooties that the most variety is to be found and the so-called "Blackburn" dobby is largely used for the weaving of these goods. This dobby as shown in Fig. 3, has the pegged lattices A arranged in two sets; one set carries all odd numbered picks and the other set all even numbered picks. The advantage of this arrangement is that long chains, sometimes exceeding 200 picks for one repeat, can be used, as special slides can be made to carry the chains over the sides of the loom. The body of the cloth begins plain, it is woven by means of the usual tappets and top roller arrangement. The threads forming the elaborate figured designs similar to those illustrated in Figs. 6, 9, 10 and 13 are drawn through special

harness cords that pass through a small comber board arrangement fixed at each side of the loom, being then connected to the dobby. Underneath the loom each harness cord is connected to a piece of elastic so as to draw the harness cord down after it is raised. Blackburn dobbies are made to control as many as 40 jacks and in some cases even this number is exceeded where special effects are desired. This system of shedding is such, however, that it is advisable to weave the cloths face side down so as to obtain a better delineation of the pattern.

The general width of the borders is about one inch but sometimes they extend as far as four inches into the cloth, and the figuring effects are often grotesque as is shown in Figs. 9, 10 and 13 and the colorings, to say the least, are bizarre, though red, black, chocolate and yellow predominate. As shown in Fig. 4 the borders are simply extra warp effects, in which the figuring is developed by a coarse colored yarn and the ground cloth being formed underneath the figure. It is thus only necessary to design for the extra warp effect as shown in Fig. 5, which is the complete working for the cloth shown in Fig. 6. Figs. 7 and 8 show two favorite styles in which birds and animals are introduced, whilst Figs. 9 and 10 are portions of the cloth from the designs. Fig. 11 shows another style of a simpler character

Fig. 7.

Fig. 8.

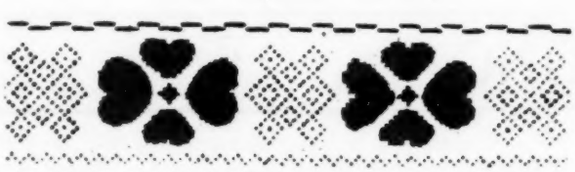


Fig. 11.

Fig. 12.

and Fig. 12 is another fancy style; Fig. 13 shows four repeats of the design given in Fig. 12 used in a border. These, however, do not make up the bulk of the trade, though there is a large market for fancy stripes which will appeal to the Hindoo. Amongst these latter may be mentioned designs made up of fishes, peacocks, sphinx and pyramids, hansom cabs, and various mottoes, a common one being "Remember me" developed in capital letters of about one half inch high. Figs. 14 and 15 are standard makes

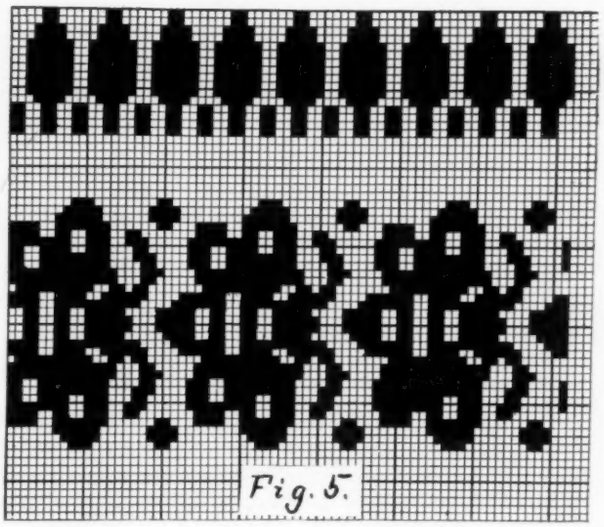


Fig. 5.

and are designs of a simple character; Figs. 16 and 17 are two comparatively plain borders, the former being a black stitch effect with black, red and yellow plain stripes on a white ground. Figs. 18 and 19 are borders of a bolder character. Fig. 18 contains black, red, pink, green, fawn and yellow yarns, whilst Fig. 19 is brought up in navy blue, red and fawn.

It may be mentioned that some borders contain mercerized figuring yarns, but no large trade is done in these. Dhooties are made up in lengths of about 40 yards, a special heading being inserted in each dhootie of about four yards long and where the goods are narrow at least two are woven in the width with a split between. The warp yarns vary from 28's to 42's and is sometimes very heavily sized—at least to the extent of 100 per cent being introduced at times —and the filling yarns vary from 40's to 60's, a common medium make would have 64 ends per inch of 36's warp and 60 picks per inch of 40's filling.

PRACTICAL WEAVING HINTS.

(Contributed Exclusively to COTTON).

BY FRED W. HORROCKS.

The loom, whether weaving cloth of the simplest, or the most complicated character, requires a greater degree of skill for its successful operation than was formerly the case. This has been rendered necessary not only by the speeding up which is so general, but also by the improved quality of the cloth required. The object of these papers is to give some practical hints to the manager, fixer, and weaver on how to produce good cloth in sufficient quantity.

One of the most important reasons why Lancashire England has been so successful in cotton manufacturing is the humidity of its climate; and whenever the climate is short of water the deficiency in the weave room or shed is made up by means of buckets of water, the fire hose, or by humidifiers. The situation of the mill and its arrangements with regard to its windows have therefore much to do with successful weaving.

Most weave rooms in Lancashire are on the ground floor, with the driving pulleys overhead. The speed of the looms varies according to the type and width of loom, the narrow plain loom running 240 picks per minute, whilst the broad quilt loom runs only 80 picks per minute. The best results are obtained when the loom is constantly at work, and

excessive speed is false economy if, in consequence, the loom is stopped 25 per cent for breakage of yarn or repairs to the loom. The manager should therefore consider the type and condition of his looms when deciding upon the speed they should run.

When the fixer has brought a new warp to a loom, he has not always the time or the inclination to examine every part of the loom, but there is no doubt that a careful examination of a loom when empty will often save a lot of time when the loom is ready for work. For instance, the weight-chains or weight-ropes around the ends of the beam could be examined. If chains are used, these, when the links are worn flat, will often stick too firmly to the beam, so that though worn chains might be used with advantage on looms weaving heavy goods, they are liable to produce uneven cloth in a light cloth loom. Ropes and leather straps are often used in dry weaving sheds for weight levers, but in damp weather these are apt to become sticky and cause uneven cloth.

The position of the back rest in the loom is often important. For plain cloth this requires to be set at least one inch higher than for twills or other kinds of heald work, in order that the top shed may be comparatively slack and so produce a full cloth, without reed marks. Most plain looms are provided with vibrating back rests which move forward a little every pick as the shed opens. The idea is that the yarn is kept at an equal tension, and therefore care should be taken that the back rest is moved forward at the right time.

The healds are hung on hooks on straps secured to bushes on a roller. These bushes have each a large end and a small end. The healds at the back are operated from the larger ends of the bushes, whilst the front healds are hung from the smaller ends of the bushes. These bushes are generally secured to the roller or shaft by set screws. A recent improvement, however, allows these bushes to move freely on the shaft, so that the healds are enabled to rise and fall in their natural position, without being pulled to one side or the other. This freedom of the healds has been found to be very beneficial to the yarn by reducing strain and friction.

Healds are now more frequently made of wire than formally. Healds for plains are, however, generally of worsted or other thread but for fancy patterns such as dobby stripes, wire healds are often preferred.

The reed is a very important factor in the production of good cloth. Whilst shallow or narrow reeds are preferred by some managers on account of their strength, their rigidity is often detrimental to the yarn. Many firms in Lancashire are now using reeds with dry banding on the bottom stave or rib. This dry banding, which is simply banding which has not been waxed, allows the dents of the reed to move about slightly when any knots or thick places on the ends are met with. For fine yarns these loose reeds are very useful, though for the sides and selvages of the cloth the dents should be fixed.

When the reed is placed in position in the loom and the sley cap is put on the fixer should see how it is placed in regard to the box backs on either side. Care should be taken that the ends of the reed are level with the box backs, or slightly further back; if they over-face the box backs they may cause the shuttle to be thrown out, or at the least to run crookedly. The reed should be examined every time it is put in a loom to see if it is of the proper curve. All reeds should curve backwards in the middle, and in fact, the box backs should also be further back at their inner ends than at their outer ends. A simple method of ascertaining whether the reed, box back, and sley are right, is to lift up all the yarn in the reed, and then stretch a thin cord from one end of the sley to the other; the cord being placed against the outer ends of the box backs, the fixer will be enabled to see if the box backs and reed form a curve. At the same time the fixer should see if the sley is curved, for the middle of the sley should be a little lower than the ends. This curve should extend the whole length of the sley, and not simply the reed space.

Much depends upon the sley being properly made, as a sley not correctly made is always a source of loss to the weaver, and trouble to the fixer.

KNITTING.

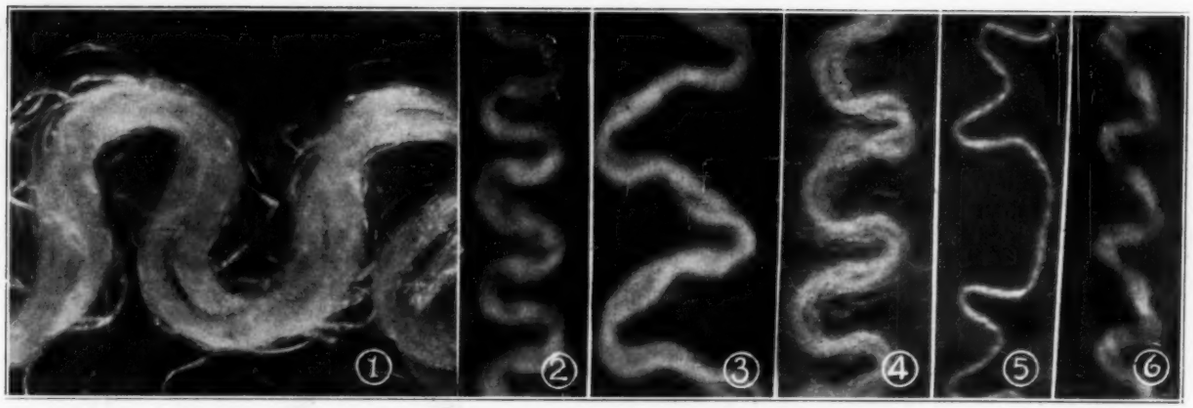
TAKE-UP OF YARN IN KNIT FABRIC.

(*Contributed Exclusively to* COTTON).

BY WILLIAM DAVIS, M. A.

When unroving a knitted fabric one is struck by the manner in which the yarn clings to the form into which it has been curved in knitting. The tendency of the material to retain its knitted form depends largely on the plasticity of the materials of which the yarn is composed. Woolen threads take on the curved form in a very marked degree and can only be straightened again by steaming. Cotton and silk yarns, especially two-fold, more easily lose the curved shape of the loops. An examination of the shape of an unroved yarn may be of considerable assistance in fabric analysis. Inspection of the back of the cloth is generally resorted to when a knowledge of the nature of the stitch is desired, but if this fails, the yarn should be slowly opened out and its passage followed carefully with the eye. In some cases, an examination of the unroved thread may be made and from its appearance the exact stitch determined. It may be interesting and instructive to examine several forms assumed by the thread during the knitting of well-known stitches. Illustration 1 will be recognized as the form of yarn resulting from the knitting of a plain stitch and we shall have occasion to examine its shape more minutely in determining the "take up" of yarn in knitting. The upper semi-circles show the portion of the loops made by the needle and the lower semi-circles show the sinker portions. Another example of a plain stitch of much finer gauge is shown at 2, where the form of the loops are slightly different in formation. They do not show the circular form so pronounced. Illustration 3 gives the form of thread for 1 and 1 rib fabric and the shape of the thread shows how it passes from face to back and the reverse thus giving a very much larger take up of yarn than is the case with the plain fabric.

The length of yarn needed to make a given width of fabric varies according to the amount of intersection it is subjected to. The yarn for rib work has to intersect face and back fabrics alternately all along its course. The opposite is the case with what are termed "tuck" fabrics, where



portions of the yarn are left unknitted on the back at regular intervals. Illustration 4 shows the form of yarn drawn from a 1 and 1 tuck cloth, the narrow portions knitting on the face and the larger portions floating unintersected on the back. Similarly the 2 and 2 tuck fabric is exhibited in illustration 5, where the two separate portions on the left represent the two knitted loops and the long straight portion the part which floated unintersected on the back for two stitches. Illustration 6 shows the thread extracted from a course of 1 and 1 shogged or twisted rib cloth and the effect of the twisting or shogging of the one needle bed is plainly evident in the shape of the thread.

EXPERIMENTAL EVIDENCE.

In order to arrive at an idea of the relation between the width of fabric and the length of yarn required to make such a width, a number of experiments were made on spring needle frames of the "Cottons' " type under conditions normal to the underwear trade. In each case the width worked was 24 inch fabric, measured at the needles, and the course was taken when the machine was in full work. If the course was inserted slowly on empty needles, the results would not correspond to the actual conditions of practice. The machine, therefore, working at full speed, was stopped at the end of one of its courses and the yarn taken to form the course drawn out and measured. The yarns employed varied in their composition, but were chiefly woolen, worsted, cotton and wool mixed and silk. The actual results are given in the table.

	Gauge Number	Needles or Stitches per inch in Width	Courses or Stitches per inch Measured in Length	Counts of Yarn Used	Width of Fabric, in inches.	Length of Yarn Required, in inches
2 Tests	30	20	30	20's Cotton	24	80
	30	20	30	20/3 Silk	24	76
2 Tests	24	16	24	2/30's Worsted	24	78
	24	16	24	12's Cotton	24	78
3 Tests	20	13⅓	20	2/24's Wool	24	76
	20	13⅓	20	9's Cotton	24	78
	20	13⅓	20	2/16's Worsted	24	80
2 Tests	16	10⅔	16	2/12's Worsted	24	72
	16	10⅔	16	3/8's Worsted	24	78
					9	696
					Average Length 77⅓ or 77.3 inches	

These results are remarkable, inasmuch as they show such uniform results for such a wide diversity of frames and qualities of yarn. The 24 inches of fabric required a maximum length of 80 inches of yarn to produce it and a minimum length of 72 inches, so that the results vary between the narrow limits of 8 inches. The average length of yarn required to make 24 inches of fabric on the needles is 77.3 so that we arrive at a useful constant for this type of frame.

77.3 inches = L (Length of yarn required).

24 inches = F (Width of fabric produced).

Therefore $\frac{L}{F} = \frac{77.3}{24} = 3.2$ or $L = 3.2 \times F$.

In other words, the length of yarn required for a given width of fabric is 3.2 times that width for plain stitch on "Cotton's Patent" frames. Ernest Tompkins gives the results of his experiments which were made on American loop-wheel knitting machines in what he describes as the law of constant length. He found that 12 inches of yarn occupied 4.7 inches when knitted on the needles and this was irrespective of gauge. When calculated as above we obtain the following constant for loop-wheel machines:

12 inches = L. 4.7 inches = F. Therefore,

$\frac{L}{F} = \frac{12}{4.7} = 2.5$. $L = 2.5 \times F$.

In other words, the length of yarn required for a given width of fabric is 2½ times that width for loop-wheel machines knitting plain fabric.

Similarly a constant can be found for any other build of frame and the same be used in calculations relating to the size and weight of knitted fabrics. Further, the matter can be extended to other makes and stitches. For instance, the 1 and 1 rib fabric, the knitted shape of which is given in illustration 3, was experimented with on the same lines and it was found that 16 inches of fabric width required 79¼ inches of yarn to produce it on a 21 gauge machine. In this case,

$\frac{L}{F} = \frac{79.25}{16} = 4.95.$

Again on a 24 gauge it was found that 9 3/8 inches of fabric width required 46 inches of yarn to produce it, or,

$\frac{L}{F} = \frac{46}{9.3} = 4.94.$

These two gauges, although different machines and experimented on with two different widths, give results almost identical with each other, so that the constant in the case of 1 and 1 rib frames of that class may be taken as 5. That is to make a piece of fabric one yard wide at the needles would require five yards of yarn.

$L \div F = 5$. $L = 5\ F$.

LATCH NEEDLE MACHINES.

Following on the same lines, experiments were next made on the flat knitting machines which work with latch needles in two beds inclined at an angle to each other. The first machine tested was one with eight needles per inch (on one bed only), and a width of 16 inches of needles was taken and a normally suitable yarn employed. The stitch first tried was plain with 12 courses per inch as was the case in the "Cotton's Patent" tests. The 16 inches of needles required 46 inches of yarn to work them, so that,

$$\frac{L}{F} = \frac{46}{16} = 2.87. \quad L = 2.87 \times F.$$

This constant comes out somewhat less than the corresponding one for "Cottons' " spring needle frames, which was 3.3. Another quality of yarn was tried and it required 43 inches to produce a width of 16 inches.

$\frac{L}{F} = \frac{43}{16} = 2.68.$ On the same machine, the needles were next made to work 1 and 1 rib, 16 inches wide, and it was found that 81 inches of yarn were necessary. To get this constant,

$$\frac{L}{F} = \frac{81}{16} = 5.06. \quad L = 5.06\ F.$$

A second quality of worsted yarn was next tried and the results came out identical with this, so that altogether the results are practically the same as those obtained for 1 and 1 rib on the "Cotton's Patent" frame.

To confirm this, another and finer gauge of knitting machine was taken, namely, one with 14 needles per inch. Sixteen inches of needles on this frame required 44 inches of yarn cotton and wool mixture.

$\frac{L}{F} = \frac{44}{16} = 2.75.$ Another test with a worsted yarn showed that 43.5 inches of yarn were needed for 16 inches of fabric.

$$\frac{L}{F} = \frac{43.5}{16} = 2.71.$$

The same machine was next set for 1 and 1 rib work, 16 inches of needles, and it was found that 77.5 inches of yarn were required to produce it.

$$\frac{L}{F} = \frac{77.5}{16} = 4.84, \text{ or } L = 4.84\ F.$$

This is slightly less than that obtained on the Cottons' frame. To hear some practical knitters talk, one would think that the whole knitting field were a cosmos and that system and orderly arrangement and connection of facts were an impossibility. These experiments, however, tend to show that underlying apparent confusion and variation, a given definite system exists which the thinking knitter must set himself to investigate.

MATHEMATICAL APPROXIMATIONS.

It is a long cry from the rigidity and symmetry of mathematical figures to the pliability of the knitted loop, but it will be interesting to examine the approximations which a consideration of those figures will give us. If we examine illustrations 1 and 2 more closely, we shall find that the current form is capable of approximation to calculate the length of resolving it into rectangles or circles. Let us try the rectangle method first.

The matter is shown more precisely in the accompanying cut, Fig. 1. The distance A E represents the width of a needle space, and the curved portion shows the length of yarn necessary for that width of needle space. Bisect A C and E F at M and N, respectively, and A E and C F at B and D, when the current portion will be given approximately by the following parts:

$$M\,A + A\,B + B\,D + D\,F + F\,N.$$

But $D\,F = C\,D$ and $F\,N = C\,M$, therefore,

$$M\,A + A\,B + B\,D + D\,F + F\,N = M\,A + A\,B + B\,D + D\,C + C\,M.$$

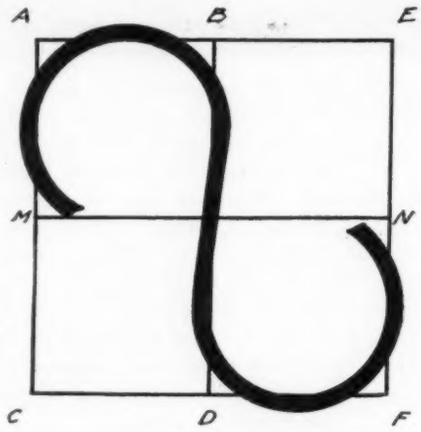


FIG. 1.

However, $M\,A + C\,M = A\,C$. Therefore, the curved portion is approximately equal to the rectangle A B C D where $A\,B = C\,D$ and $A\,C = B\,D$.

To obtain the length of the sides of this rectangle, therefore, will be equivalent to getting the length of yarn required to make one needle width of fabric. The length depends in the first place on how deep the loop is sunk. If we take a simple case where the loop is long and is sunk a distance equal to a needle division, we obtain the following length:

A E = needle space or N.

$A\,B = B\,E = \frac{1}{2}N.$

$A\,B = C\,D$. Therefore $A\,B + C\,D = N$.

The depth of the loop is given by A C as being equal to a needle space = N, and thus the length of the four sides of the rectangle is given as follows:

$A\,B + C\,D = N$. $A\,C = N$. $B\,D = N$. Hence,

$A\,B + C\,D + A\,C + B\,D = N + N + N = 3\,N.$

Thus the length of yarn is 3 N or in other words three-times the needle space, which means that the fabric width produced would be one-third of the yarn employed. In the formulæ of our former experiments, we obtain, $L = 3\,F$ for plain stitch. For a length of stitch such as is normal in a "Cotton's" frame, the depth would only be 2/3 of the needle width and for this case the length would be calculated approximately as follows:

$A\,B + C\,D = N$. $A\,C = 2/3N$. $B\,D = 2/3N$. Hence,

$A\,B + C\,D + A\,C + B\,D = N + 2/3\,N + 2/3\,N = 2.3\,N$, or $L = 2.3\,F$.

Comparing this figure with that obtained in experiment we find that the approximation is quite close to the case in practice, because something fails to be added to allow for the curving of the stitches in knitting, thus causing them to take up and use slightly more yarn.

DYEING, BLEACHING AND FINISHING.

THE MANUFACTURE OF ARTIFICIAL SILK FROM COTTON.

(*Contributed Exclusively to* COTTON).

BY H. R. CARTER.

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Cellulose is an extremely important substance and capable of being utilized in a number of ways. There is a wide field of research open for the discovery of methods of dealing with it to adopt it to numerous uses in a safe, cheap and useful manner. Cellulose has neither taste nor smell. It is a white solid and insoluble in all the usual solvents. It is found in an almost pure state in the pith of the elder tree, in lint, filter paper and old linen. Its chemical composition, according to various authorities, is represented by the formulæs C 12 H 10 O 10, C 6 H 10 O 5, and C 24 H 20 O 20.

Although it has been proposed to use such cellulose substance as the exhausted pulps constituting the residue from the extraction of sugar from beetroot for the manufacture of artificial silk, yet cotton has always been found to be one of the best and most economical raw materials to use, the first cost of the raw material being of less consequence than the cost of labor and upkeep of the plant. Dry cotton is composed of about 98.5 per cent of pure cellulose, a larger percentage of pure cellulose than any other product on the market, and 81.5 per cent of pectic matter, which forms a thin layer on the surface.

The best cotton to use is a good class of Egyptian or Sea Island comber waste. A very good class of American comes next. Length of staple is of no consequence; however, it is found in practice that the fineness, flexibility and silkiness of the cotton has an influence on the quality of the silk produced.

In preparing the cotton for solution it is very important that all pectic and greasy matter should be removed. Unless this be done, satisfactory nitrations and spinning solutions can not be produced. The best way of effectually removing grease and pectic matter is to bleach the cotton by the ordinary process as employed by manufactures of antiseptic wadding. Care must, however, be taken in the bleaching so that the fiber is not tendered. The whitening of the fiber, which is produced by the bleaching process, has a considerable effect upon the whiteness of the finished silk. Cotton opened and ready for solution should just sink in distilled water. If there is pectic or greasy matter left, it will float. It must not show any reaction when tried with litmus paper.

The most modern method of bleaching this class of waste consists in first mechanically cleaning the material of shell and etc., by willowing. It is then blown through a trunk into a specially constructed boiling kier which is fitted with a special filling or depositing apparatus consisting of a sprinkler arrangement producing a shower of spray which meets the flocculent cotton as it enters, rapidly penetrates and moistens it, causing it to deposit itself upon the perforated false bottom of the kier. The surplus liquid flows back to the reservoir containing the spraying liquid which is continually circulated through the spray defused by means of a special pump, the rate of circulation being easily regulated. In this way about 2,000 pounds of raw cotton waste may be automatically filled in, in the short space of half an hour, being damped down and reduced in volume to such an extent that it may be contained in a kier about 6 feet 6 inches in diameter and height, lying closely and evenly. The filling apparatus is then removed and replaced by a perforated lid and an internally fitted cover so that the wet cotton is firmly enclosed between two perforated discs, with the result that no flocks of fiber can be carried away by the circulation of the preparatory and boiling liquors, thus avoiding loss of material and danger of stoppage in the pipes and valves or clogging in the circulating apparatus. The circulation of the preparing liquor thus produces absolute penetration, causes the material

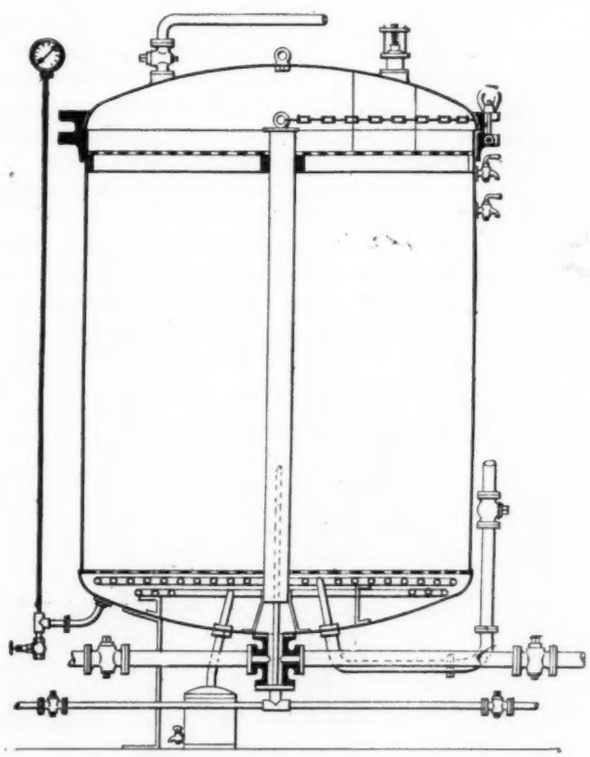

FIG. 1. HIGH PRESSURE BOILING KIER.

under treatment to give up a good deal of the impurities adhering to it, opens it and softens it and thus prepares it in an economical manner for the subsequent boiling operation.

Boiling is accomplished in the same, but now hermetically closed kier, under high pressure, with alkaline lye combined with a small proportion of turkey red oil, the air still contained in the cotton having first been driven out. A five or six hours' boil is usually sufficient and is followed by direct washing out in the same kier. The boiled cotton may then be transported by an overhead runway to a second kier to be bleached and neutralized, the respective baths being circulated through it. The bleaching bath acts upon the material for two hours without pressure, the liquor consisting of a perfect solution of chloride of lime, or sodium hydrochloride, or electrically produced bleaching

liquor. Owing to the preceding thorough preparation and boiling, it is only necessary to keep the strength of the bleaching liquor at about 3/4 degree Tw, or 2 per cent of active chlorine.

The bleaching bath is followed by a thorough rinsing, half an hour in sours and then a final thorough washing out in the same apparatus without removing the material

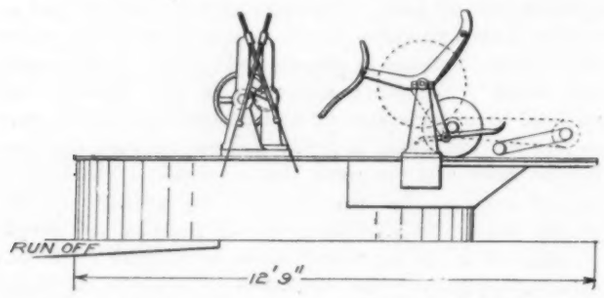

FIG. 2. ELEVATION OF OVAL WASHING MACHINE.

under treatment. From the bleaching apparatus the cotton falls into a receptacle which forms part of the rinsing machine, the latter being provided with an automatic discharge to the hydro-extractor, which with the wet cotton opener or hopper feeder and the drying machine, forms a well arranged set of finishing operations in which manual labor for the transport of the material is entirely eliminated. All the working parts of these machines must be carefully protected against rust or oxidation.

Fiber treated in this way is chemically pure, quite white and absolutely free from oxycellulose and particles of shell.

Fig. 1 shows the form of high pressure boiling kier required, and Figs. 2 and 3 an oval washing machine with

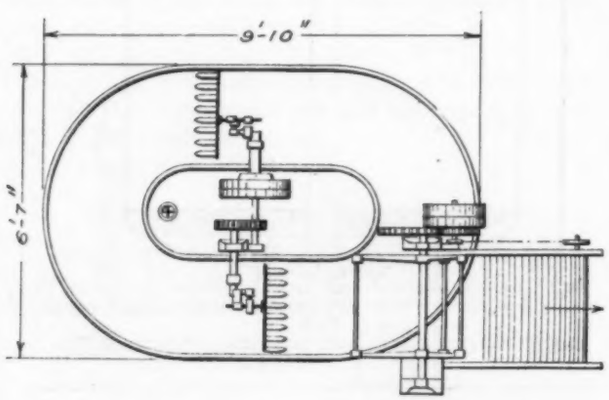

FIG. 3. PLAN OF OVAL WASHING MACHINE.

two forks for washing out the bleached waste. The lattice drying machine referred to as being a convenient one to dry the washed and bleached cotton waste consists of an insulated chamber containing a series of superposed traveling lattices and an air heater and fan for circulating the hot air through them. The lattices are so arranged that the wet locks of waste which have been opened out by the spiked sheet of the opener or feeder are deposited upon the top lattice which in turn lets its contents drop upon the lattice underneath and so on until the last lattice conducts it out of the machine in a thoroughly dry condition.

(To be Continued).

The world's estimated consumption of commercial cotton for the year ending August 31, 1912, is 20,402,000 bales of 500 pounds net.

DYEING OF UNION PIECE GOODS.

Union piece goods, as manufactured at the present time, comprise a very wide range of fabrics, including besides cotton, pure wool, regenerated wool, mohair, silk and mixtures of the several fibers. The most important line of union goods, however, comprises fabrics made chiefly with a cotton warp and a wool or worsted filling, which may or may not contain a small amount of cotton together with regenerated wool and pure wool.

According to the weight and quality of the finished product, the amount of pure wool is increased or decreased; consequently the dyer of these goods should be in a position to handle these fabrics in a satisfactory manner when delivered to him for dyeing.

Considering first the dyeing of medium weight union fabrics, such as find a large outlet in the manufacture of men's and women's garments to be sold at medium prices, we find almost invariably the cotton warp present, and according to the amount and kind of surface and finish the goods are to have will depend very largely the amount of color to be used in dyeing or "covering" the cotton. It frequently happens that the amount of cotton is so great and the amount of wool so slight in a fabric, that the dyer is put to extreme measures to cover the cotton so as to prevent it from showing when the goods are finally finished.

In order to successfully dye union goods, it is necessary that the choice of colors be made from those groups of dyestuffs that will dye the cotton somewhat fuller and heavier than the wool, in order to allow for the finishing. Preparatory to dyeing, however, the goods should be thoroughly scoured and made as nearly free as possible from picker house oils and soaps. It is practically impossible to rinse out the very last traces of soap from the scours, but under no circumstances can it be expected that first-class dyeings can always be made when the goods are delivered to the dyer in a soapy condition.

Ordinarily, dyestuffs adapted for union goods are divided into three groups which, for convenience, we designate groups 1, 2 and 3.

Group 1 comprises all those diamine colors that dye the cotton and the wool under the same conditions, about the same shade and depth;

Group 2 includes those diamines which dye the cotton more than the wool, while

Group 3 comprises those diamine colors that dye the wool more than the cotton.

To these three groups may be conveniently added the 4th group, consisting of a range of neutral dyeing wool colors that dye the wool in a neutral bath at the boil, without in the least tinting or impairing the shade of the previously dyed cotton.

The practical dyer will, at once, readily appreciate the importance of this fourth group of colors, as it enables him to secure certain effects desired when the finished cloth is viewed overhand and which impart brilliancy to the wool in the fabric.

By far, the largest amount of union cloth is dyed in the piece and generally by what is known as the one-bath method. It consists of dyeing the goods in a bath charged with a suitable amount of dyestuff and Glauber's salt, gradually raising the temperature of the bath to the boil, with constant working of the fabrics over the winch, maintaining this temperature for from one-half to one hour, after which allowing the goods to continue running, during

which the steam is shut off and the bath allowed to gradually cool. It is during this last half-hour's run that any shading that may be necessary to produce the match is effected. The necessary shading colors, usually from the fourth group of dyes previously mentioned, are added, and a patch cut at sufficient intervals, that the dyer may judge the effect of the added color.

Where the dye house is running on a standard line of goods to be matched to a given shade, the matching is done during the dyeing of the first set of pieces, in order to establish a formula after which the second and succeeding sets are dyed, without any hindrance. If, during the dyeing of the first set, it is found necessary to add any of the colors of the fourth group, these same colors may be added for the second and succeeding sets with the other quantities of dyestuff necessary for the cotton and the wool.

It sometimes happens that when pieces are coming regularly into the dyehouse, that the dyer notices that an established formula for previous sets does not yield the same results with other sets. Other things being equal, such differences in shade as may be noticed can usually be traced directly to admixtures in the wool stock and where such changes in the composition of the wool are made, especially when regenerated wool is added, the dyer should be informed of this fact, in order that he may change the nature of his formula to overcome the effect of the added stock. Where carbonized stock is used, also, the dyer should be informed, in order that he may give a final rinse to the goods, to insure the removal of acid, or to add to his dye-bath a slight amount of sal soda, to effect the same object.

The best results in dyeing union piece goods are always attained when the dyevat is heated by indirect steam, for the reason that where direct steam is employed, the dye-bath becomes gradually weaker as it becomes heated and a given quantity of dyestuff known to produce a certain depth of shade when a bath is heated indirectly is liable to produce a much weaker shade when heated by direct steam. Where direct steam must be used, suitable allowance should be made in the bath for condensation. It is also necessary to have the inlet pipe so constructed that the steam does not strike directly on the pieces during dyeing, and under no circumstances should the steam pipe supply steam to one corner of the dye-bath, as this will invariably cause the pieces running over the winch at the end of the dye-kettle to be dyed a much fuller shade than the pieces running over the winch at the middle or at the opposite end of the dye-vat.

The maximum volume of dye-liquor for successful dyeing should never exceed thirty times the weight of the goods to be dyed; in other words, one pound of cloth requires 3½ gallons of total dye-liquor. When heated by indirect steam, this volume of water can be run into the dye-kettle at once, but, as mentioned above, when heated directly, a lesser quantity must be used.

The amount of Glauber's salt necessary for dyeing should be about 4 pounds for each 10 gallons of liquor. After entering the pieces and running to wet them out thoroughly while the dye-bath is becoming filled and when the dye-bath has nearly attained its proper working level, the previously dissolved dyestuff should be added, and after running the pieces a few times, in order to become evenly saturated with the dyestuff, then the Glauber's salt can be added. Steam should be turned on and allowed to run for about half an hour.

For medium heavy shades and blacks, navy blues, etc., after adding the dyestuff and Glauber's salt, the bath may be boiled up and the pieces entered, but for light shades, it is better to gradually turn on the steam, after the pieces have been entered. After running half an hour, the goods are sampled and if the desired shade is not yet obtained and both the wool and the cotton appear weak, a further addition of dyestuff is made to the liquor and the bath again brought to the boil, the goods being worked for a further one-half hour. If the wool continues to remain light, dyeing is continued at a simmer, after adding a small quantity of wool dyestuff from group 4, to bring up the shade. On the other hand, however, if the cotton lacks depth, the goods are simply allowed to run in the cooling dye-bath, which thereby allows the cotton to feed on the excess of color remaining in the bath, and, if necessary, adding such dyestuffs from group 2 as circumstances require.

Light shades almost completely exhaust the dye-bath and it may be allowed to run off. On the other hand, dark shades do not exhaust the dye-bath completely and some color remains. It is a question whether any economy is effected by saving such a dye-bath for subsequent lots, after a batch has been dyed. The amount of color remaining, while appearing to be considerable, nevertheless is not sufficient to give any depth to a new set of pieces and consequently greater economy is no doubt effected by allowing the spent, though not completely exhausted, dye-bath to run off and to rinse the pieces in the dye-kettle.

It sometimes happens that certain lines of union goods require to be dyed with colors possessing special properties of fastness, chiefly resistance to perspiration, acids, etc. Dress goods, as a rule, not requiring this degree of fastness, are dyed as above described, but for linings and similar fabrics, the so-called diazotized and developed blacks are much employed. These products are dyed in the following manner: The well scoured and rinsed cloth is dyed with a suitable quantity of dyestuff and Glauber's salt, as previously mentioned for the diamines; the kettle is afterwards run off, refilled with cold water and 3 per cent nitrite of soda previously dissolved in cold water, and 8 per cent commercial muriatic acid. The goods are kept running for about half an hour, when the nitrite bath is run off, the goods given a rinse, the kettle refilled and the bath charged with 1 per cent developer and ½ per cent soda ash. The cloth is kept running for half an hour, when the black is fully developed. The kettle is run off and the goods given a thorough rinse, after which they are ready for finishing.

Light weight fabrics to be dyed a fast black may be equally well dyed in an ordinary yarn kettle of sufficient size, provided with a winch that may slide from one end of the kettle to the other, but such a kettle applies only for moderate production.

The two-bath method lends itself admirably for the production of two-color effects, although it is also considerably used for the dyeing of solid shades. There are four ways of applying this method; the first is where the wool is previously dyed with acid colors fast to milling, or with chrome colors, and subsequently dyeing the cotton in the piece, the goods being well rinsed after dyeing with acid colors. The dye-bath is charged with suitable diamine colors from group 2, which dye the cotton deeper than the wool, the amount of Glauber's salt being about 2 pounds per 10 gallons of liquor, together with ¾ of an ounce of soda ash. The dyeing may be carried out either in a dyeing machine of the ordinary type, or a jig. For certain classes of fab-

ries, the cotton may be previously dyed with diamine colors and the wool subsequently dyed with acid colors. The dyebath should be as small in volume as possible and charged with from 3 to 4 per cent of dyestuff, 2 pounds Glauber's salt and 1½ ounces soda ash per 10 gallons of liquor, the goods being run for about one hour. Rinse and cross-dye as required in an acid bath.

It is interesting to note and as tending to save one handling of the goods that cotton may be previously dyed in the milling machine by adding to the soap solution a suitable dyestuff from the above group, the dyeing and milling proceeding simultaneously. After milling, the goods are rinsed in the usual manner and cross-dyed as described.

Certain fanciful effects may also be obtained, if cross-dyeing with acid colors is not done, by using diamine colors that are adapted for dyeing in the cold.

Another method of dyeing union goods is to dye the wool in the fabric with dyestuffs fast to milling and to subsequently dye the cotton with immedial colors. Although adapted for the dyeing of piece goods, this particular method finds its widest application in the dyeing of compound yarns. The reverse of this method, however, finds wide application in the dyeing of colors to possess particular fastness, not alone to the successive dyeing and finishing operations, but also to the waterproofing treatment with rubber solutions and prolonged exposure to light and weather. As a matter of fact, the dyeing method about to be described for union goods is an ideal method for fabrics intended for automobiles, yachts, etc. The cotton in the fabric is first dyed with immedial colors, the necessary amount of the dyestuff being dissolved in their own weight of sodium sulphide and double their weight of glucose, with the aid of heat. This solution is added to the lukewarm bath, and after adding 3 ounces of soda ash and, according to the depth of shade desired, from ½ to 3 pounds of crystal Glauber's salt per 10 gallons of liquor, the goods are entered at about 100 degrees F. and allowed to run for two to three hours. So far, the cotton only has been dyed, the wool at most being but slightly tinted with color. The bath is then run off, the goods rinsed while running over the winch, and the wool in the fabric dyed with fast acid colors which, during dyeing, have no action whatever upon the shade previously dyed upon the cotton. Not only are union shades capable of being produced by this method, but a very wide variety of compound and mottled effects are easily secured.—*Dyestuffs.*

STAINS AND BLEACHING FAULTS.

Rust marks or iron stains are are recognizable by their color, and can be readily confirmed by the Prussian blue test. If damp cotton is allowed to lie in contact with iron for any length of time, stains are almost certain to form, and the same may be caused by iron screws or bolt heads in wooden vessels, or by contact with the sides of a boiling kier. This last may be prevented by giving the interior of the kier a lime wash with thick milk of lime, adding a little albumen to this to make it stick; then allow the coat to dry thoroughly and boil out with a strong solution of soda. Drops of water from steam condensing upon overhead pipes are a fruitful cause of rust stains, although these can be removed by treatment with sour. These parts in a dyehouse should be always kept well painted, and if the iron is scraped clean of rust before the paint is applied, it will last ten times as long as if applied on the top of the rust. With piece goods carrying iron stains which have been contracted in the weaving process, the removal of these is much more difficult, as in such an instance the iron is associated with oil—and this generally a mineral one. Stains of this kind may have been caused in the weaving by allowing the warp to remain too long in contact with metallic iron, particularly when the warp has been sized previously with a mixture containing zinc chloride. This, as is well known, is liable to contain traces of chlorate, which readily induces the oxidation of iron. If the hydrochloric acid of the souring bath is not sufficiently strong to remove the stains, a proportion of oxalic acid should be added, or the material should be put through acidified bisulphite of soda.

Very obstinate stains which are difficult to remove may be treated separately with a concentrated solution of acid, but if the mineral acids are used for this purpose the very last traces must be washed out before the goods are dried. On account of this tendering danger, many bleachers and dyers use the organic acids, citric and oxalic, for removing stains, but even these should be removed by washing before the cotton is dried. Laundries use a solution made up of 10 per cent acetic acid saturated with oxalic, and when the stains consist of iron and a mineral oil, local applications are made by rubbing in a hot solution composed of one part neutral soap, one part glycerine and 3 parts water. If the stains are too numerous to treat individually, the whole piece is passed through a bath of oxalic acid at a strength of 6 degrees Tw. Another method for the removal of obstinate iron stains by treatment is to bring the spots into contact with an acidulated solution of potassium ferrocyanide, then to decompose the blue formed by treating with caustic soda. In this way the iron oxide left in the fiber is freshly formed and, in the majority of cases, can be easily removed by souring. On similar lines old iron stains can be treated with ammonium or sodium sulphide, following this up by a subsequent bath of sour, and the treatment should be repeated if the first is not successful. Lead is also responsible for stains very similar in appearance to those formed by iron, and these mostly arise from the lead pipes used in the work, while the action of chemic converts the lead salt into peroxide which is absorbed by the fiber. With lead-lined boiling kiers caustic soda must not be used, or stains will result; the same thing applies to hydrochloric acid used in the sour bath, lead chloride being formed in the latter instance, which forms the basis for stains developing.

The use of acids for the removal of such stains is not to be recommended; they certainly remove the appearance of the stain, but leave the lead salt on the fiber, and in course of time this may again be developed. Such a thing as sulphuretted hydrogen from the burning of coal gas may cause stains to form where lead salts are held, the combination producing lead sulphide, which is a brownish black. Lead salts may be recognized by their turning white when hydrochloric acid is applied, and then black to brown. When moistened with sulphide of ammonia this turns black again, and the test may be confirmed by applying a spot of bichromate solution which forms the well-known yellow lead chromate. Other stains may be due to the formation of oxycellulose, and these are more to be feared than any other, as they are both incurable and also bad to trace.—*Dyer and Calico Printer.*

"Courtesy can neither be bought nor coerced, but must come spontaneously."

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all.

SOME SPINNING CALCULATIONS.

EDITOR COTTON:

In the spinning department there are many calculations to be made, but the most responsible and often the most dreaded calculations are, averaging numbers, production twist, twist constants, and "ratio." The writer believes that the spinners as a rule, experience more trouble in the above calculations than in anything else connected with this department.

The majority of spinners today get their average numbers by taking the numbers of the different yarns in the room, adding them up and then dividing the sum of the numbers by the total number of the different numbers of yarn in the room. For instance, suppose in a room there were four different numbers, 10's, 12's, 15's and 20's, respectively, the calculation would be made as follows:

$10 + 12 + 15 + 20 = 57$. $57 \div 4 = 14.25$'s average number, which is in no wise the proper number.

The spinner should figure his average number in proportion to the number of spindles in his room operating on each number of yarn. Then, should anything happen that a certain number of spindles be stopped or time lost for any reason, such as accidents, lack of roving, waiting on bobbins, etc., he would get the advantage of these delays in his average number and in his production.

For example, suppose in the former calculation, a shaft should break, or roving should give out on a certain number of yarn and the machines on this number should be delayed for a time. This delay would not effect the average number at all and the production would be required for number 14.25's yarn, and the spinner could not get anything allowed for the delay, as he gives in his average number at 14.25's and naturally a 14.25's production is expected.

To get the actual average number in a room, the total number of spindles in the room must be used; the number of spindles on each yarn must be used; and the amount of spindles operated in a stated time must be used. Assume in the above case that there were 6,000 spindles; 1,400 spindles on 10's, 1,000 spindles on 12's, 1,500 spindles on 15's and 2,100 spindles on 20's. The correct average number would be as follows:

1400×10's	$= 14000$
1000×12's	$= 12000$
1500×15's	$= 22500$
2100×20's	$= 42000$
6000	90500

Then $90500 \div 6000 = 15.08$'s average number.

Rule: Multiply the number of spindles on each number by that number until the total numbers in the room have been dealt with. Use the sum of these numbers for a dividend and the total number of spindles operated, for a divisor; the result will be the average number.

It will be seen in this case that 15.08's is the average number, and 15.08's being finer than 14.25's gives the spinner the advantage of the former method.

Now we assumed that the total 6,000 spindles were in operation, but suppose a certain section has stopped for a day, it will be readily seen that the number of spindles would be less than 6000 in such a case for the work operated. The spinner should keep an account of just how many machines are operated on each number per week, so that at the end of the week there would be little trouble in getting exactly the number of spindles operated.

In a certain mill the writer had under his charge two small spinning rooms. In one room there were 4,512 spindles on 12's contained in 15 machines of 256 spindles each, and 3 machines of 224 spindles each. In the other room there were three different lengths of machines; five machines on 12's, 224 spindles; four machines on 7¾'s, 204 spindles, and 18 machines on 9's, 232 spindles. It will be seen that both rooms had a spindle capacity of 10,624.

It will also be seen that there were 5,632 spindles on 12's, 816 spindles on 7¾'s, and 4,176 spindles on 9's. Then to get the average number of these rooms it would be performed as before:

5632×12	$= 67584$
$816 \times 7\frac{3}{4}$	$= 6324$
4176×9	$= 37584$
10624	111492

$111,492 \div 10,624 = 10.49$ or 10.50's average number for both rooms.

PRODUCTION.

In figuring the actual production the best method requires the average number of yarns and the average front roll speed. The method usually adopted is to get a speed indicator and take the speed of the front roll on each machine, then add the different speeds and divide the sum by the number of machines in the room. The percentage allowed for stoppages, etc., is governed by the number of the yarn, the finer the yarn the less percentage is allowed. We will figure the production from the 10.50's average number and allow 10 per cent for stoppage. Assuming that the average speed of the front roll is 150 r. p. m. and the total number of spindles 10,624.

Rule: Use 374 as a production constant, which is a standard constant based on 60 hours per week. Divide the constant by the average number. This gives a production multiple which, when multiplied by the r. p. m. of the front roll, gives the pounds per spindle per week of 60 hours. From this result deduct 10 per cent for stoppages, etc. The remainder multiplied by the number of spindles in the room will give the total production.

Example: $374 \div 10.50$'s $= 3.56$ multiple. 3.56×150 r. p. m. $= 5.34$. $5.34 - 10$ per cent loss $= 4.80$ pounds per spindle in 60 hours, or $5.34 \times .90 = 4.8060$ pounds per spindle in 60 hours.

$10,624 \times 4.80 = 50,995$ pounds production per week for the total number of spindles.

RATIO.

In figuring the ratio, the percentage to be allowed for a slippage of the bands varies according to the size of the

bands, the size of the cylinder and the speed thereof, but the usual percent of slippage to be allowed is 10 and we will use this in the ratio calculations. To get the ratio: Divide the diameter of the cylinder by the diameter of the whorl in inches and fraction thereof with 10 per cent added to the divisor.

Example: What is the ratio between whorl and cylinder allowing 10 per cent for slippage of band; the whorl being 1 5/8 inches in diameter and the cylinder being 8 inches in diameter?

1 5/8 = 1.62. 1.62 + 10 per cent = 1.72. 8 inches cylinder diameter ÷ 1.72, the diameter of the whorl plus slippage, = 4.60 ratio.

It will be noticed that the whorl and cylinder given are for twisters and they were used to make twisting ratio clear. The spinning whorl and cylinder ratios are obtained in exactly the same way. Example: What is the ratio between whorl and cylinder, allowing 10 per cent slippage for the band, the whorl being 13/16 inches in diameter and the cylinder being 7 inches in diameter?

13/16 = .81. .81 + 10 = .91. 7 ÷ .91 = 7.69 ratio.

TWIST CONSTANT.

As the twister twist constant gives more trouble to the overseer than the spinning twist constant, the writer deemed it best to use this in the examples to make the constant clear to the reader. However, the same rule applies to the spinning machine as well. Rule: To find the twist constant of a spinning or twisting machine, take the number of teeth in the front roll and multiply by the number of teeth in the "jack gear." This result multiplied by the ratio will give the dividend. Then multiply the diameter of the front roll by the cylinder gear and this result multiplied by 3.1416 will give the divisor. The dividend being divided by the divisor gives the constant.

Example: What is the twist constant of a twister with a front roll gear of 112 teeth; diameter of front roll being 1½ inches, jack gear 96 teeth; cylinder gear 50 teeth; the diameter of the whorl being 1 5/8 inches and the cylinder being 8 inches in diameter?

1.50 × 50 = 75. 75 × 3.1416 = 235.62, which is the divisor. 112 × 96 = 10,752. 10,752 × 4.60 = 49,459.20, or the dividend. 49,459.20 ÷ 235.62 = 2.09, the constant.

It is perhaps advisable to state that the twist to be inserted in both single and double yarn varies according to the class of goods to be made and the designer of the mill generally gives the spinner the twist multiple for each class of goods. But in making ordinary yarns such as warp and filling, 4.75 is always used as the warp multiple and 3.25 is generally used as a standard filling multiple. However, on hosiery yarns the twist multiple gets as low as 2.50 in cases where an extraordinarily soft yarn is desired.

The majority of doubled yarn for carpet warp is usually twisted with a 4.60 twist multiple. In cases where a good class of weaving yarn is being twisted, the twist multiple is the standard, 4.75.

The multiple for sewing twine yarn is for the single yarn usually 5.00, but where the balance twist is required it varies from 6.00 to 6.60. For doubled yarn from 4.00 to 5.00 twist multiple used. The buyers of the yarn sometimes designate the twist they desire inserted in the yarn, but not frequently.

Rule to find twist to be inserted in the yarn of any number, the twist multiple being known: Multiply the square root of the number of yarn by the twist multiple.

Some spinners allow for contraction, but I do not, for I have never been able to detect any loss in twist by a twist tester in the yarns made from my calculations.

Example: What twist per inch should be inserted in 13's warp? √13 = 3.6056. 3.6056 × 4.75 = 17.12 turns per inch. The number of turns divided into the twist constant will give the gear required to produce the desired twist per inch.

In twist calculations for doubled yarn, what twist should be inserted in a three-ply number 12's yarn? 12 ÷ 3 = 4's resultant yarn. √4 = 2. 2 × 4.60 twist multiple = 9.20 turns per inch.

Rule: First find what number the 3-ply will make when twisted together. Then proceed as in the usual twist calculation.

To get the gear required, divide the constant by the turns per inch. Using 209, the constant secured in the previous calculations. What gear would be required to give 9.20 turns? 209 ÷ 9.20 = 22.71, or a 22-tooth gear.

Y. L. Y. (Georgia).

FINDING THE DEAD TWIST.

EDITOR COTTON:

I notice in the April issue of COTTON that "W. C." failed to grasp the rule I have to get "dead twist," but the rule I have given is absolutely correct to get a starting point. It might be possible that he would have to change a tooth or two one way or the other. The rules I have given in a previous issue are quite simple to anyone who will look them over carefully, but judging from the last article of "W. C." he did not comprehend the full meaning which I intended to convey. Now, if he will look it over again, he will see very plainly what the 20 per cent is taken off for, and as this 20 per cent is a constant for my conditions in figuring "dead twist," I thought it was not necessary to repeat why it is used, in every example. The first example was fully worked out, and the last stated to proceed as in above examples, which I thought was clear enough.

The 3.21's multiplied by 3.60 which have 11.52 turns, should have read, the square root of 3.21's = 1.79. This, multiplied by 3.60 gives 6.44 turns per inch. "W. C." should have known this was an error, after reading my first example.

If we put 18 turns of right-hand twist in 23's combed Egyptian, what number of turns of left-hand twist must be put into this yarn when it is made into an 11 ply 23's yarn so that the two twists will hang dead?

To get the twist multiple, divide the square root of the counts, which is 23 = 4.79 into the turns per inch, which gives 4.79 into 18 = 3.77 as a multiple for 23's single yarn. Now allow 20 per cent from the single yarn multiple on account of putting in the left-hand twist, which takes the twist out of single yarn when making the 11 ply 23's. This reduces the multiple from 3.77 to 3.01. We now have to get the resultant counts of 23's 11 ply, which is 2.09; therefore, the square root of 2.09 is 1.44 which, multiplied by 3.01, gives 4.33 turns per inch.

It is too much to expect to figure it out to a tooth. We must adapt ourselves to circumstances, such as the kind of ring we use, whether vertical or flanged. There are several points to consider, but this rule will give the starting point to get the desired "dead twist."

The 20 per cent I deducted from the single multiple for

the ply multiple, absolutely balanced the twists in my case. Conditions might be somewhat different in "W. C.'s" mill. In his case he has to allow 30 per cent to get his 3.70 to 3.80 turns per inch by the cut and try method.

23's = 4.79 ÷ 18 gives the multiple 3.77. Allow 30 per cent for the ply multiple on account of taking out twist when making it into 11 ply yarns. This gives a multiple of 2.63. Now, multiply the resultant counts of 11 ply 23's, which is 2.09. The square root of this is 1.44 which, multiplied by 2.09, gives 3.78 turns per inch. I trust "W. C." will get some information from this article, and I will be pleased to hear from him in the future asking further questions. X. Y. Z. A. (Michigan).

THE WRAPPED PRESSER.

EDITOR COTTON:

"Where does the twist come from?" is the question "A. C." puts to the readers of COTTON in the March issue in regard to the different number of times a flyer or presser may be wrapped on a roving frame. He claims that to wrap a presser more than four times will put in more twist per inch in the roving than three times, and three times more twist than two times, etc. "A. C." has become confused. He just thinks it does, and he cannot produce any facts to show that he has put in more twist for the twist is not there. Twist can be taken out by unwrapping the presser, but never put in by additional wrapping.

What is the twist on a roving frame, assuming that all gears are tight on shafts and there is no slippage of cone belt? Positive, of course. Why? Because the power is transmitted through gears from front roll to the spindle and there is no chance to increase the twist only through a change of the twist gear, and not by increasing the number of wraps on the presser. Does "A. C." think by adding a wrap to the presser that it will cause that spindle to revolve faster than the spindle beside it? Surely not. Yet, in order to obtain the increased twist, the speed of the spindle would be the only way to increase it, and that cannot be done by adding a wrap. However, the speed of the spindles on a roving frame is positive, and the twist is controlled by the speed of front roll governed by the twist gear that is on the frame, not affecting the speed of the spindles but the speed of the front roll, for the spindle speed remains the same, whether more or less twist is desired.

Now the question arises, if twist cannot be put in by adding wrappings, how can it be taken out by reducing same? The answer is a very plain and simple one. The roving frame is so constructed that as the bobbin fills for every additional layer of roving wound on the bobbin the speed of the bobbin decreases in proportion to the increase in its diameter on a frame correctly geared, having properly shaped cones and running under ordinary conditions. Assuming that the frame has just been doffed ready to start, that all bobbins measure the same in diameter, that the surface speed of the bobbins is just right to take care of what the front roll delivers, and that the frame will run perfectly from starting of the doff until the bobbins have been filled, without the speeder tender having to take up or let off the tension. Conditions are equal on all flyers except two. One is wrapped once, the other twice. What will be the result?

All spindles and flyers are making the same number of revolutions per minute, and these two bobbins of roving will have the same amount of twist per inch to start with for a short time that the others have, but by not being wrapped the same as the others these two bobbins are being wrapped with less tension than the rest, consequently the diameter of these two bobbins will increase out of proportion to the decrease in the circumferential speed, as the roving is being wound on soft. The one wrap bobbin is softer than the two wrap bobbin and consequently will fill faster than the two wrap.

As all bobbins are supplied the same number of yards per minute from the front roll, and as the one wrap is softer and more spongy than the two wrap, and the two wrap softer than the three wrap, the one wrap bobbin will be found larger in diameter than the two wrap, and the two wrap larger than the three wrap. Consequently as the same number of yards have been supplied to all, it will be found that the bobbin with one wrap will contain more yards than the two wrap, and the two wrap more yards than the three wrap for the same number of yards delivered by the front roll. This is because the increase in diameter of the bobbin has stretched the roving, producing less twist per inch, the stretching taking place between the presser and the circumference of the bobbin after the twist has been supplied to the strand, producing a strained and uneven roving.

To prove this, how often does a speeder tender pull off a layer of single from a bobbin and in putting up the end only wrap the presser once or twice in order that the end will stay up and the bobbin will regain the correct diameter so that it will take up what the front roll delivers? To increase wrapping will not put in twist but will wind roving on bobbin firmer and harder, which will strain and stretch same, causing more ends to snap at the presser, more piecings and less production. It is a much better and safer policy to make a smooth, even roving with not quite so much on the bobbin than to produce a hard-wound bobbin which will last longer in the creel, yet will produce an uneven and weak yarn, which four wraps will surely give.

It is to be understood that the foregoing statement applies only to a frame whose wrappings on the pressers are mixed, and not to a frame where all the wrappings are the same, whose wrap on all flyers alike has been increased or decreased at the will of the operator. Should it be deemed best to increase or decrease the wraps, then the tension of the frame must be adjusted so that the bobbins will take care of what is delivered by the front roll in proportion to the tension on roving produced by what wrap is used. A firm, well shaped bobbin is a very nice thing to look at, and at first thought is just the thing to have, because it will last longer in the creel and take longer to fill up on the frame. But, after careful consideration, years of experience, and close observance, it is found that it is not what is needed.

Length of staple and climatic conditions both have their effect on the quality of work spun from a firm, hard bobbin. The longer the staple, the firmer the bobbin can be made, up to the point where there is enough elasticity in the roving to counteract contraction and expansion, as a bobbin of roving will expand more than it will contract, and if it is wound on a bobbin tight and firm enough to consume this elasticity, stretched roving will result. To prove this, one can take a hard-wound bobbin of roving and size from same, the sizing possibly will be correct. Lay the same bobbin away for a week and size again from the middle layer and note the difference. Put the roving in

the spinning frame and it will be found that the yarn spun from the middle of that bobbin is lighter and more uneven than that made from the outside when the bobbin was fresh. What has caused this? The bobbin has been wound so tight that the elasticity of the fibers has been destroyed, hence, when expansion took place, strained roving resulted.

Ga.-Ala. (Alabama).

WHO WILL ANSWER THESE?

EDITOR COTTON:

I wish to ask the following questions of the readers of this department:

(1) Why was the Creighton opener discarded by manufacturers? It will be remembered that in this machine, the stock was struck while in space, while on all our up-to-date picking machines at the present time, the stock is struck on a metal roll which serves as a cushion.

(2) Why was the bobbin-lead frame adopted?

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SPINNING TWIST.

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The proper twist to put in yarn is generally determined by using the square root of the number as a basis. As will be seen this gives a regular scale. Multiply the square root of the number by a certain constant to obtain the turns per inch to be placed in the yarn: For warp yarn the square root of the number multiplied by 4.75 has been found to furnish a good starting point; for filling yarn the square root of the number multiplied by 3.25 is generally used under ordinary circumstances.

For example: suppose we wish to start a new frame on No. 16's warp yarn and it is desired to know what twist is required in order to determine what twist gear to put on the frame. The square root of $16 = 4$ and $4 \times 4.75 = 19$, the turns per inch required for No. 16's warp yarn.

Now suppose we wish to start a new frame on No. 16's filling yarn and desire to know what twist is required. The square root of $16 = 4$, then $4 \times 3.25 = 13$, or the turns required for 16's filling yarn.

It will be found advantageous to vary from this rule under certain circumstances, these conditions being better known from experience and observation than by any written rule. One principle, however, holds good for most all cases and that is: the warp yarn should be made as strong as possible in order to better withstand the strain that is put upon it during the later processes, especially the weaving, where the warp is subjected to considerable strain by the action of the harnesses and reeds.

Two much twist in the yarn decreases the production and this feature is by no means to be disregarded. Where the yarn is dyed after being spun, too much twist does not allow the yarn to absorb the dye properly and will not give good results, as only the outer surface of the yarn will contain the dye stuff, whereas it should penetrate to the core. Still another case presents itself in goods that require a soft feel. If the warp yarn contains an unusual amount of twist the goods will feel harsh and wiry. In such goods as towelings, the yarn to have the necessary absorbent quality must not be spun with too much twist.

Filling yarns are generally spun with less twist than warp yarn as will be seen from the foregoing rule. The reason for this is on account of the filling yarn not being subjected to any of the strains that are put upon the warp yarn, and because it gives the cloth into which it is woven a softer feel.

To find the gear required to give a certain twist take a frame with the following gears, for example: What twist gear will be required to give 19 turns per inch for No. 16's warp. First we find the constant number for twist. We have a frame with three gears, cylinder gear 40 teeth, jack gear 70 teeth and front roll gear 112 teeth. Circumference of front roll 3.1416 inches. Ratio 7 inches cylinder to ¾ inch whirl = 8.24. The following formula will give the constant.

$70 \times 112 \times 8.24 \div 40 \times 3.1416 = 514.08$ constant number. The constant divided by the turns per inch will give the gear required or vice versa $514.08 \div 19 = 27$. To find the twist gear required to give 19 turns per inch would be $514.08 \div 27 = 19.04$ turns per inch. J. A. G.

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COTTON MACHINERY

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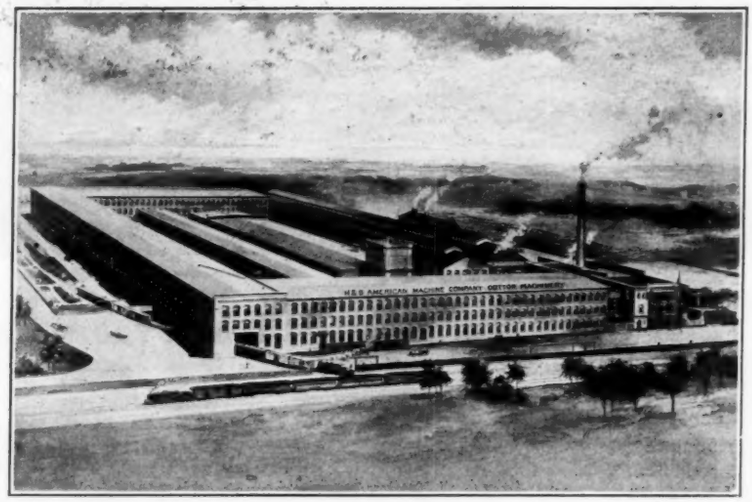
Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

NEW MACHINERY AND TRADE NOTES.

ALLIS-CHALMERS MANUFACTURING CO.

On April 16th, 1913, Allis-Chalmers Manufacturing Co., took over the properties and entire operation of the business of Allis-Chalmers Co., which latter company during the past year has been in the hands of a receiver. This change marks the end of the Allis-Chalmers receivership and the commencement of the administration of the new company.

Beginning with April 16th all business has been and will be conducted by Allis-Chalmers Manufacturing Co., which start out under conditions promising success. The new Company will operate all departments of the business as conducted by its predecessor and will carry out all contracts on hand for the sale of its products. It has no bonded indebtedness nor liabilities of any character. In addition to all assets of the former Allis-Chalmers Co., the new company has over four million dollars additional cash for new working capital which has been raised through the recent reorganization.

The new company will continue to operate the large West Allis works and Reliance works at Milwaukee, the Chicago works, and in addition will control the operations of The Bullock Electrical Manufacturing Co., at Cincinnati. Otto H. Falk, of Milwaukee, who for the past year has been receiver of the Allis-Chalmers Co., and under whose management as receiver the operations of the business have shown marked improvement, has been elected president of the new comapny. The general offices will be at Milwaukee.

All properties of the new company are in good condition and its inventories and working capital on a sound basis. Its engineering departments are well equipped and the various lines of product now turned out are of the highest quality. Under these conditions it is believed that with the present careful and intelligent management the operations will show substantial profits.

The Wildman Mfg. Co., of Norristown, Pa., were distributing a unique souvenir at the knit goods convention at Philadelphia last month. This was a neat pocket calculator made of superimposed celluloid circular cards, by the manipulation of which one can calculate the production of a knitting machine according to the size of the yarn used. It is a very neat and useful contrivance.

Arabol gum G, one of the staples of THE ARABOL MFG. Co., 100 William St., New York, when used in its pure state gives excellent results in light or heavy sizing of cotton warps and is especially recommended for use in export goods, such as China sheetings, drills, denims, coarse or medium goods, etc. Mixed with starch, it gives more volume and adhesive power, adding at the same time, elasticity and tensile strength.

the spinning frame and it will be found that the yarn spun from the middle of that bobbin is lighter and more uneven than that made from the outside when the bobbin was fresh. What has caused this? The bobbin has been wound so tight that the elasticity of the fibers has been destroyed, hence, when expansion took place, strained roving resulted.

Ga.-Ala. (Alabama).

WHO WILL ANSWER THESE?

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(1) Why was the Creighton opener discarded by manufacturers? It will be remembered that in this machine, the stock was struck while in space, while on all our up-to-date picking machines at the present time, the stock is struck on a metal roll which serves as a cushion.

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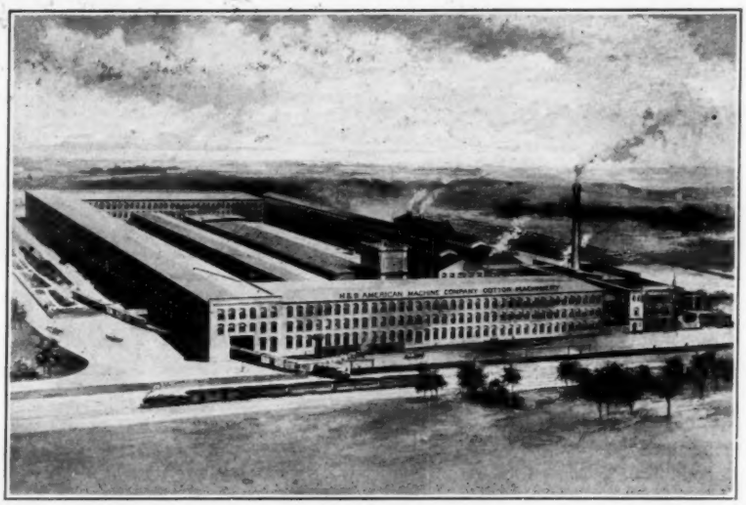

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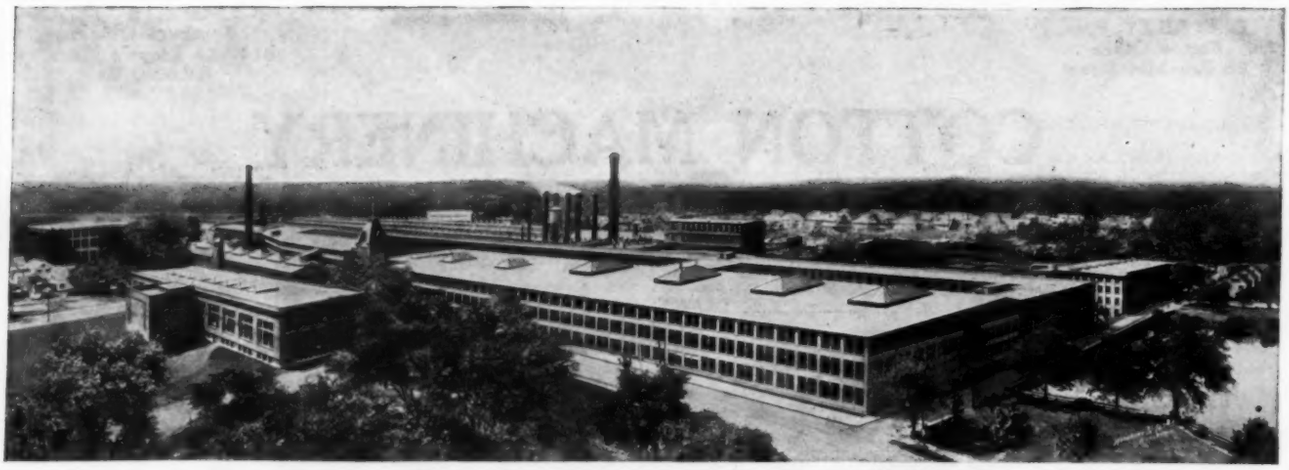


DRAPER COMPANY WORKS, HOPEDALE, MASS., 1912.

We reproduce herewith a view of the Draper Company works at Hopedale, Mass., taken last year. The various buildings of this plant now have a combined floor space of over 33 acres. Such a plant is necessary to conduct a business where the orders annually exceed 20,000 Northop looms.

TRADE PRESS CONVENTION.

President H. M. Swetland of the Federation of Trade Press Associations in the United States has announced that the eighth annual convention will be held at the Hotel Astor, New York, September 18 to 20, 1913. The Federation includes the New York Trade Press Association, the New England Trade Press Association, the Chicago Trade Press Association, the St. Louis-Southwestern Trade Press Association, the Philadelphia Trade Press Association, and a number of unaffiliated publications, the total membership being two hundred and thirty-six, representing over seventy-five different trades, industries and professions.

Two sessions will be held daily. There will be editorial, circulation, advertising and publishing symposiums, under competent leaders. Many of the leading editors, business managers, buyers and sellers of advertising and authorities on modern merchandising methods will take part.

On Friday afternoon, September 10, there will be a mass meeting with addresses by representative business and professional men, on subjects of timely interest to editors, publishers and advertisers. Distinguished guests and worth while speakers will be at the annual banquet, which will be made a memorable occasion.

Invitations are being extended to manufacturers, sales managers, advertising men, trade paper publishers and all others interested in the idea of business promotion through trade press efficiency, which is to be featured at the convention.

The BERLIN ANILINE WORKS, 215 Water St., New York City, are sending to the trade a new color card describing Paranil Green B and G and Paranil Olive D. These are recommended for dyeing cotton in the raw state, cops slubbing, cheeses and piece goods. They are also valuable for discharge printing. A copy of this color card may be secured by applying to the New York office.

AN IDEA FOR YOUR SUMMER VACATION.

The passenger traffic department of the Central of Georgia Railway Company has recently issued a splendidly illustrated folder descriptive of that perfect sea trip from Savannah to New York or Boston via the palatial steamers of the Ocean Steamship Co., known colloquially as the "Savannah Line." So great has been the growth in popularity of this line from a tourist's standpoint that in 1910 it was necessary to build two magnificent new steamships for this service. Ocean travel is undoubtedly the most pleasant diversion for the summer vacation. The tang of the salt sea air; the thrill of departure; the hurry of late passengers; the lowering of the gang plank; the waving of handkerchiefs; the silent throb of the engine as the ship picks its way among the harbor craft toward open water, all assist in sounding the call to the busy man that the time has come to take a rest and the ideal way is now before him. Copies of this booklet with complete information about the trip via Savannah and the steamship to New York and Boston can be secured on application to J. C. Haile, General Passenger Agent, Central of Georgia Railway Co., Savannah, Ga.

John H. Giles has severed his executive connection with the Klauder-Weldon Company, although still interested in the concern to a certain extent. He has organized the John H. Giles Dyeing Machine Company, incorporated under the laws of the state of Maine. The business will be conducted from Amsterdam, N. Y. The officers are John H. Giles, president; Donald M. Giles, vice-president. The board of directors is composed of the above named officers and in addition E. C. Giles and B. S. Keefer. They are to put on the market a perfected and improved rotary skein dyeing machine, as well as raw stock, garment, hat, hosiery worsted top, cotton beam and other modern types of dyeing apparatus. Announcement to the trade will be made soon.

THE AMERICAN PULLEY CO. are mailing out a wall hanger entitled, "The Salesman's Creed." This hanger is becomingly prepared on two shades of art paper printed in black and gold, and with a silk cord inserted with which to attach it to the wall. It is something to which every true salesman might well sign his name.

Barrett Specification Roofs

Seavy Hardware Co., Roofers.

Bursley Building, Ft. Wayne, Ind. Mahurin & Mahurin, Architects

Not An Experiment

WHEN a practical man has a large building to roof, like this one, he cannot afford to take any chances. He does not want an experiment. He wants a roof of proved merit. That is why Barrett Specification Roofs are so popular.

Roofs constructed according to the principles laid down by The Barrett Specification have been giving satisfaction for *more than sixty years.*

Such a roof is constructed of five plies of tarred felt, with coal tar pitch as the waterproofing material, and covered with a top surface of gravel, slag or tile. Its life is usually 20 years or more; it rarely requires attention during that period, and is fire retardant.

Ask our nearest office for a free copy of the Barrett Specification. It will convince you that such a roof is bound to give satisfaction.

SPECIAL NOTE

We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:

ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

HYDRONON

The Damp-proofing Paint.

Especially recommended for use above the ground level on the interior of stone, brick or concrete walls to exclude dampness. Has superior covering capacity and is vastly superior to other paints in its permanence and resistance to dampness. It penetrates into the pores of the brick so that an accidental abrasion does not break the waterproof seal. Furnishes satisfactory base for plaster and keeps the plaster from injury by dampness in the wall.

VELVEX

Creosote Shingle Stains.

Send for the new free booklet, handsomely printed in colors, showing the beauty of these stains. Very economical and satisfactory.

BARRETT MANUFACTURING COMPANY

TRADE B MARK

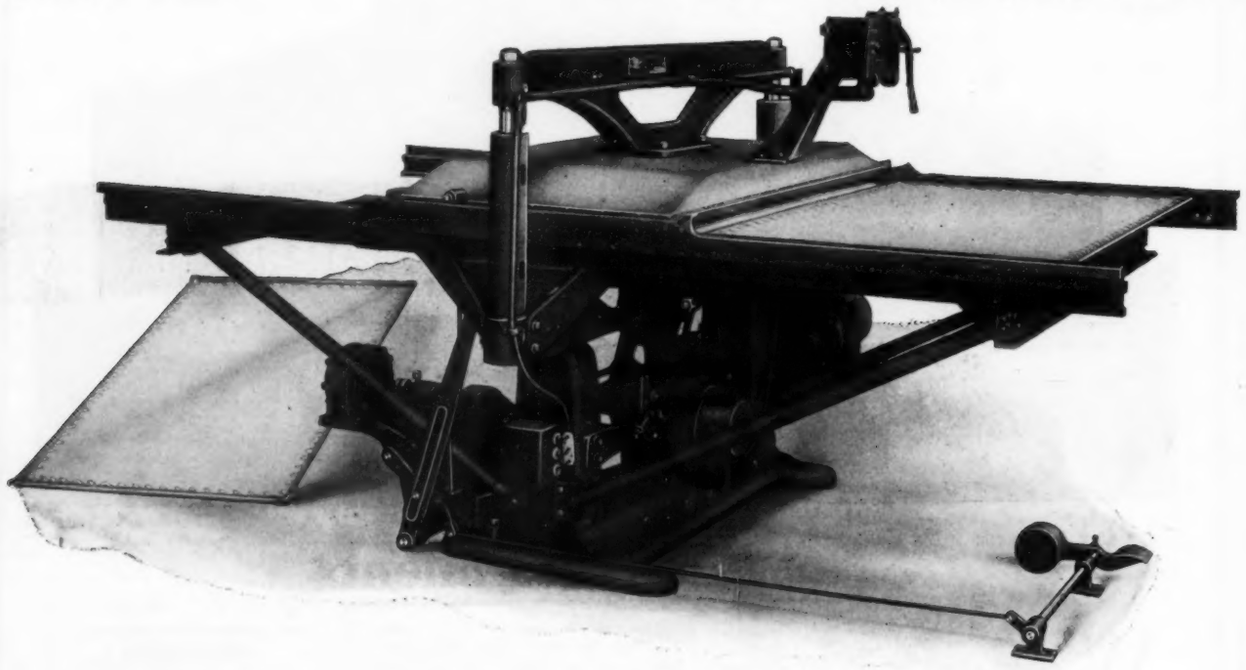
New York Chicago Philadelphia Boston St. Louis Kansas City Cleveland
Cincinnati Minneapolis Pittsburgh Seattle Corey, Ala.
THE PATERSON MFG. CO., Ltd.:—Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B. Halifax, N. S. Sydney, N. S.

A NEW UNDERWEAR PRESS.

Pressing underwear and similar knit goods has always been more or less of a problem to the manufacturer. The demand for something better—some more convenient method that would insure a more uniform and satisfactory finish to the goods as well as increase the quantity—prompted the construction of the New American Underwear Press.

In operation it is entirely automatic. The goods are first pinned or simply placed on canvas covered frames. These frames are made of hollow tubing to which a single sheet of canvas is tightly laced and are exceptionally light in weight. They are 40 x 60 inches in size, sufficient to allow for pressing from one to six garments at a time, depending of course on the size of the pieces. There are six frames regularly furnished, and additional ones may be had at a small cost, so that there need be no delay in operating the machine.

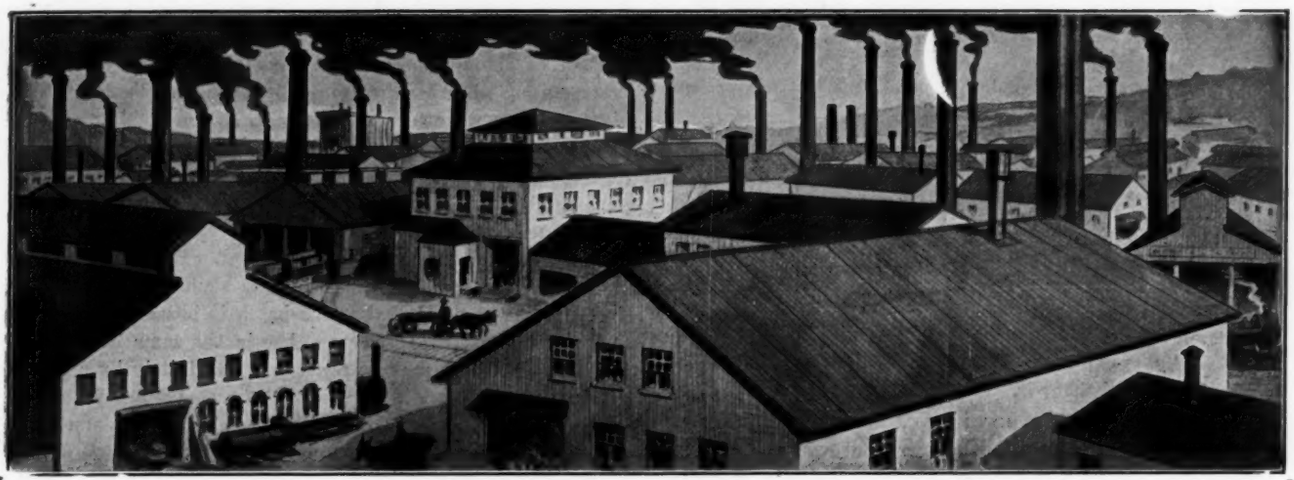
The capacity of this press depends entirely on the amount of time which the goods must be held under pressure, and the number of pieces that can be pressed at one time. The uniform heat and pressure together with the carefully constructed padding used greatly reduces the pressure time formerly required. The gears furnished are adjustable, and allow for a pressure contact varying from about 13 to 40 seconds. By figuring the number of pieces that can be placed on the frames at one time, as well as the number of seconds pressure they require, it is possible to figure out quite accurately the capacity of the press for any particular kind of goods. Special gears, however, can be furnished, which make possible a contact as low as seven seconds, bringing the capacity of the press up to a decidedly larger figure. The number of operators required will of course vary according to their ability to place the garments on the frames; however, when accustomed to it five or six can easily handle the work when operating the machine at its highest capacity. Further information concerning this machine may be secured by applying to the American Laundry Machinery Company, 132 W. 27th Street, New York.



AMERICAN AUTOMATIC UNDERWEAR PRESS.

The frame containing the goods is first placed on the extended arm of the machine as shown in the illustration. A touch on the foot treadle carries it to the center of the press directly underneath the steam heated chest. The instant it is in just the correct position, pressure is automatically applied, bringing the goods in contact with the steam heated chest, holding them there for a predetermined number of seconds, and then releasing them automatically. During these few seconds required to press the goods and release them the operator has placed another frame in the machine. The pressure now being entirely released on the goods underneath the chest, the operator again places her foot on the foot treadle, carrying the goods already pressed to the extended arm on the opposite side of the machine, and carrying the frame just inserted directly underneath the chest where pressure is again automatically applied as before. The only manual operation necessary on the machine, aside from placing and removing the frames, is the simple pressure that is applied to the foot treadle.

"Infringement of Trade Marks and Trade Names, and Unfair Business Competition," is the name of a little booklet compiled by Orson G. Munn, of the New York bar, and published by Munn & Company, 361 Broadway, New York City. This little booklet deals with the effects of a trade mark and the necessary requisites in order to register a trade mark. It shows the effects of registration and defines the difference between infringement and unfair competition. It carries quite a collection of interesting data pertaining to the subject named, compiled in a concise form for the busy man. No price is named on this booklet, and it is probably intended for free distribution among those who are or may be interested in registering trade marks and trade names.



THERE ARE OVER 300 IMITATIONS OF

RU-BER-OID ROOFING

Some of these imitations look like RU-BER-OID but that is merely on the surface. The roofing buyer cannot see what is underneath, or he would not be fooled in buying goods on their appearance only.

As a house built on a poor foundation cannot last, neither can a roofing founded on poor material give the service expected of it.

Take None but the Genuine

RU-BER-OID

Accent on the "RU" and always spelled with one "B"

Unless the RU-BER-OID Man is shown on the outside wrapper, the roofing is not the genuine RU-BER-OID

KA-LOR-OID (Colored Ruberoid) ROOFING

RED---BROWN---GREEN

The permanently colored prepared roofing

The ideal roofing for Bungalows, Cottages—in fact suitable for any building where artistic effect is desired.

The Standard Paint Company,

100 Wiiam Street, NEW YORK

BOSTON. CHICAGO. DENVER.

FAR-AWAY CUSTOMERS.

When the antarctic explorers came back last winter from the South Pole the first port from which news reached the world was Christchurch, New Zealand. Christchurch is a city just about the size of Manchester, N. H., and is one of the most southern ports in the world. The port of Dunedin on the same southern coast of New Zealand, is a little further south. Christchurch in 43:34 latitude is also about the same distance from the south pole that Manchester, N. H., in latitude 43 is from the North Pole. It was the nearest port for the explorers. Yet Manchester products are shipped to Christchurch.

The Felton brush factory, one of the most unique industries in Manchester, has grown so much in the past 30 years that today it has foreign selling agencies in Montreal, England, France, Germany, Spain, Italy, Argentina and in the United States of Colombia, in the Philippines, in Japan, in Melbourne and in Christchurch. If the antarctic explorers, when they touched their first port, had needed a Felton brush, they could have gotten it there in Christchurch.

Nor is the growth of the factory told by selling agencies. It started with two or three hands, and now gives employment to 140 or more people. Its products follow the shoe and cotton industries. Wherever these commodities are manufactured by American methods, some one uses this product. Many people have no conception of the variety of brushes which are used. The Felton factory furnishes them from the little 7/8 inch brush used by dentists to the big awkward street brush, which late at night is seen cleaning the street. There are brushes for silversmiths and manufacturers of silverware; others for hardware manufacturers, for cotton, woolen and knitting mills, for tanneries, for silk mills and paper mills.

The Felton factory furnishes more mill brushes than anybody else in the world, and 90 per cent of the shoe polishing brushes used are shipped out of their Manchester plant as the product of people who make Manchester their home.

The Joseph Dixon Crucible Co. have just published a new booklet entitled "Graphite for the Boiler." This booklet deals with no new discovery, for graphite has been sold to remove scale from boilers for many years. It simply states in as few words as possible why and how Dixon's boiler graphite does its work. No startling claims are made, for the subject is too old to longer be sensational.

If you have used graphite, you know its wonderful effectiveness. You realize how much fuel it saves annually by keeping the boiler tubes and shell clean, and how much time and labor it saved in cleaning your boilers. Also how little it costs as compared with boiler compounds. But if you do not use it, read every word of the booklet carefully. Judge from the uniform satisfaction experienced by others, what Dixon's boiler graphite will do for you.

The Joseph Dixon Crucible Co. is the oldest and largest manufacturer of graphite and graphite products in the world. They stand behind every one of their hundreds of different products and boiler graphite is no exception to the rule. Write them at Jersey City, N. J., for their booklet, "Graphite for the Boiler," which will be sent you free of charge.

A new process for bleaching textile fabrics or fibers has lately been discovered by Oswald F. Rothe, superintendent of the Southern Aseptic Cotton Company, manufacturers of absorbent cotton, Chattanooga, Tenn. This discovery was made in an effort to secure a bleach that would contain no matter deleterious to absorbent cotton.

The advantages claimed for the process are that it will perfectly bleach in one operation taking only two hours. No boiling kiers are necessary. Neither caustic soda, chloride of lime nor sulphuric acid is used. By mixing dyestuffs with the bath the most delicate shades may be produced at the same time that the batch is bleached. Colors may be produced one after another in the same bath, it is claimed. The bath may be continued indefinitely by adding after each operation 10 per cent of the compound for each bath. A vat six feet square will handle 2,500 pounds a day. The bleach and dye processes are demonstrated to be fast and the yarn retains its life and natural strength. For this reason the compound is known as "Natural Life." A company has been formed at Chattanooga known as the Anti-Caustic Bleach Company, and it is understood that this company will provide the compound on a royalty basis. Further information may be obtained from the company at Chattanooga or the William Taylor Stearns Company, 215 Fourth avenue, New York, who are agents for the Southern Aseptic Cotton Company, and who will show samples of the work done by this process.

THE HESS-BRIGHT MFG. CO., of Philadelphia, Pa., are sending to their customers and friends a neatly prepared sheet punched for use in a binder, describing ball bearings and their correct use, which will be furnished on application. Series 336, sheet 93, class 5, describes a pulley mounting for a rope drive or hoisting sheave, and the instruction in connection with this drawing also refers to data sheet 1A class 2 and 14 class 1, This contains very interesting information for the master mechanic and chief engineer of textile plants, inasmuch as material of this description filed in their offices will be extremely handy for reference and furnish valuable and correct information on a subject which should interest them greatly. Furthermore, the Hess-Bright Company announce that they maintain an engineering department for the purpose of aiding their customers to secure the best results by giving them the benefit of the wide experience they have naturally attained in this field. No charge is made for this service and all customers are urged to avail themselves of it freely. When inquiring for these data sheets a reference to COTTON might be worth while.

We are in receipt of an interesting collection of sample fabrics designed and woven by the students of the textile department at the A. & M. College, West Raleigh, N. C. These samples make a very creditable showing and when it is remembered that the designing and weaving of fabrics is only one portion of the work done during the textile course at this school, it shows the thoroughness of the methods used. Prof. Nelson, the principal of the textile department, informs us that they have many more inquiries for students than they have graduates and that these inquiries come from both the North and South. This speaks well for the work done by the students who have already graduated and for the methods adopted by this school and its instructors.

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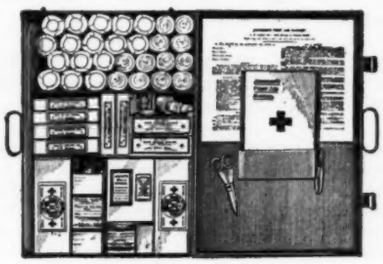

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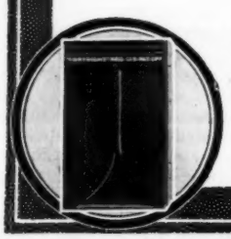

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THE GEORGE P. CLARK CO., of Windsor Locks, Conn., are sending to the trade their bulletin L 2 which features their latest type of transfer trucks which they have just put on the market. This elevating truck is built in accordance with the usual Clark thoroughness and it is claimed by the makers to be superior to the truck which they featured in Bulletin L, which was issued last August. The style of these trucks as we described in COTTON at the time of the issuance of Bulletin L, is to utilize stationary platforms on which to pile the goods and when it is desired to move these platforms, the transfer truck can be pushed under the platform when the frame of the truck is at its lowest position. The truck is then elevated sufficiently to raise the loaded platform from the floor and it is then rolled wherever it is desired to carry the goods. The length of time which it takes to do this work is extremely short and it is claimed that the elevating mechanism works so easily that a boy can elevate a loaded platform. A more complete description of these transfer trucks, together with prices may be secured by application to this company for a copy of their Bulletin L.2.

Volume 2, No. 2, of the Quarterly Booklet issued by the Textile Department of the North Carolina College of Agriculture and Mechanic Arts, West Raleigh, N. C., has been received. This splendidly illustrated booklet gives a complete description of the courses of instruction offered by the textile department together with illustrations and descriptive matter pertaining to the school, its instructors and its students.

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MILL NEWS

Notices of mill projects, additions or improvements are solicited for this department

ALABAMA.

ALABAMA CITY. The Dwight Mfg. Company are making some changes in their Y. W. C. A. building and are putting in shower baths. They are also making arrangements for a summer school for mill people only.

PRATTVILLLE. John Curwen, the well-known carder of East Tallassee has resigned his position at that place to take over the carding department of the Prattville Cotton Mills Company.

STEVENSON. The Stevenson Cotton Mills are adding 600 spindles to their equipment.

ARKANSAS.

HELENA. As a result of financial troubles at the Bank of Helena, the St. Francis Cotton Mills have been forced to suspend operation indefinitely.

GEORGIA.

ATLANTA. The Atlanta Hosiery Mills are adding the necessary machinery to increase their production 33 1-3 per cent the coming season. This increase is necessary in order to keep pace with their sales, and with the improvements they are making in staple lines. Another increase is expected at an early date.

ATLANTA. The capital stock of the Exposition Mills have been increased from $500,000 to $700,000. The money from the sale of the new stock will be utilized to pay for the enlargements and improvements recently completed.

AUGUSTA. The stockholders of the Sibley Mfg. Co., in their recent annual meeting, re-elected all the officers and directors. T. S. Raworth is president.

BARNESVILLE. The building for the Collier Mfg. Co., is going rapidly forward and when completed will consist of a brick building 50 x 150 feet two stories high thoroughly equipped. This company is also to install improvements in their bleachery knitting room, etc. The contract for electrifying the plant has been let. These changes will double the capacity of this company and will place them in a position where they can turn out 3,000 to 4,000 dozen garments per week. The officers of this company are J. C. Collier, Barnesville, president; D. C. Collier, Barnesville, secretary, treasurer and general manager, and R. C. Collier, Barnesville, superintendent.

CHICKAMAUGA. The new cotton mill of the Crystal Springs Bleaching Company, of Chickamauga, is under construction, and is to be equipped with 20,000 spindles and 700 looms. It is understood that this factory will manufacture bag goods.

COLUMBUS. The Muskogee Mills recently purchased some additional spindles for their mills.

LA GRANGE. The Unity Spinning Mills of this place have finished the installation of 4,000 additional spindles and 8 of the 12 additional operatives' houses have also been completed. The other four are progressing rapidly.

TRION. It is reported that the Trion Cotton Mills are planning extensive alterations and expect to increase their capacity.

WEST POINT. The Lang Mfg. Co., are to install electric drives in their mill. Power will be furnished by the Columbus Power Company, of Columbus, Ga.

ILLINOIS.

CHICAGO. The Paramount Knitting Company has increased their capital stock by $200,000.

MARYLAND.

ILLCHESTER. The Thistle Mills has completed the installation of electric motors in their weaving department.

MISSOURI.

St. Louis. It is reported that the Fulton Bag & Cotton Mills, of Atlanta, are to erect a $300,000 plant at the southeast corner of Broadway and North Market street.

NEW YORK.

AMSTERDAM. Work on the new mill for the Chalmers Knitting Company is progressing rapidly.

BUFFALO. The Universal Hosiery Company has been incorporated with a capital of $5,000.

NORTH CAROLINA.

BURLINGTON. Some machinery for the new Southern Hosiery Mills of Burlington is being installed in the second story of the Chrisman building and it is expected to be in operation before the end of May.

CHARLOTTE. The Fidelity Mfg. Co., of Charlotte, is making extensive improvements on their mill and village.

HILLSBORO. It is reported that William Iselin Co., of New York, have been appointed selling agents for the Eno Cotton Mills.

HIGH POINT. Work has been started on the new factory of the Highland Cotton Mills.

LEXINGTON. The Lexington Mfg. Co., is making extensive improvements and repairs.

LEXINGTON. The Erlanger Bros., of this place, are making thorough investigations and going into the cost necessary to increase the size of the new cotton mill. It is proposed, if the deal comes off, to build the new mill 967 feet long instead of 667 feet, as at present contracted for.

LEXINGTON. The Wenonah Cotton Mills are adding some new spinning frames and speeders.

LONG ISLAND. The Long Island Cotton Mill has amended its charter so as to increase its capital to $100,000. Osborn Brown is secretary.

NEWTON. The Catawba Cotton Mills are adding new spinning frames and equipment.

STATESVILLE. The Paola Cotton Mills are adding 8,000 spindles and some accompanying machinery.

OHIO.

COLUMBUS. The Mitchell Mfg. Co., of Portsmouth, have taken over the Scott Knitting Co., of this place, and will make a medium grade of men's knit union suits.

OKLAHOMA.

OKLAHOMA CITY. The Cotton Mills Securities Company is endeavoring to complete arrangements whereby they may proceed in the construction of the proposed big cotton mill plant at this place. Several thousand acres of land are owned by this concern, a portion of which is to be used for the site of the mill. This is the development in the Southwest that was referred to a number of months ago as being planned and proposed by W. B. Smith Whaley, of Boston.

RHODE ISLAND.

PAWTUCKET. The new plant of the Pawtucket Hosiery Co., on Dexter street, is progressing rapidly and will be in a position to start in the near future.

SOUTH CAROLINA.

ANDERSON. At the annual meeting of the stockholders of the Conneross Yarn Mill, which was held recently, the following officers were re-elected: A. S. Farmer, president and treasurer; T. B. Earle, vice-president; D. R. Lassiter, secretary and assistant treasurer. It is reported that the mill has done well during the past year and that prospects for the future seem to be bright. Machinery for the new mill has been shipped and will be placed in a short period. It is expected that at least a part of this machinery will be in operation by the time this notice is published.

GREENVILLE. The Camperdown Mill is to construct an addition to its present plant. This addition is to be 26 x 105 feet, one-story high, of brick.

GREENVILLE. The Greenville Thread Company has been incorporated. The intention of this concern is to manufacture cotton thread.

ROCK HILL. The Hamilton Carhartt Mfg. Co., of Rock Hill, has been incorporated with a capital stock of $100,000. The company is to do a general business in the manufacture of workmen's clothing. This company will take over the overall manufacturing department of the Hamilton Carhartt Mills.

UNION. The New Monarch Cotton Mills, which has been discussed for some little time, when built, will be a four-story structure with basement, 380 feet long by 125 feet wide. It is to be equipped with 20,000 spindles and 500 looms for manufacturing cotton cloth. T. C. Thompson and Bros., of Charlotte, and Birmingham, Ala., are progressing with this contract.

UNION. The Ottaray Mills are adding additional spinning frames of the Fales & Jenks type.

TENNESSEE.

CHATTANOOGA. The Southern Aseptic Cotton Co., of this place, expect to enlarge their facilities by erecting additional buildings and purchasing additional equipment to the extent of approximately $250,000. They also have unmatured plans for the establishment, in connection with their plant, of a general bleaching plant. This bleachery will probably cost something like $100,000. The purpose of establishing this bleachery in connection with their present mill is to have the advantage of a formula recently discovered by the chemist in charge of their laboratory.

CHATTANOOGA. The Standard Processing Company, of Ridgedale, where construction has been in progress, have nearly completed constructing a building 176 x 84 feet, two stories, mill construction; warehouse, 45 x 100 feet, two stories, brick; boiler-house, 41 x 41 feet; at a total cost of about $35,000. Equipped with mercerizing, gassing, drying, quilling and cone-winding machinery to produce about 20,000 pounds of yarn weekly.

DAYTON. It is reported that C. Y. Haggard is interested in a plan to establish a knitting mill at this place.

TEXAS.

PARIS. It is reported that the Board of Trade of Texas is planning the organization of a $300,000 cotton mill company.

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Mining
Methods

Unequaled
Transportation
Facilities

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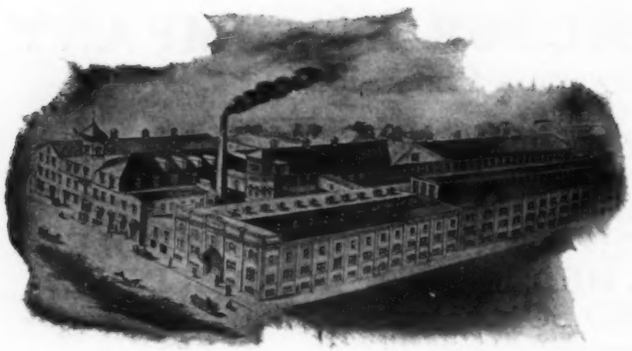

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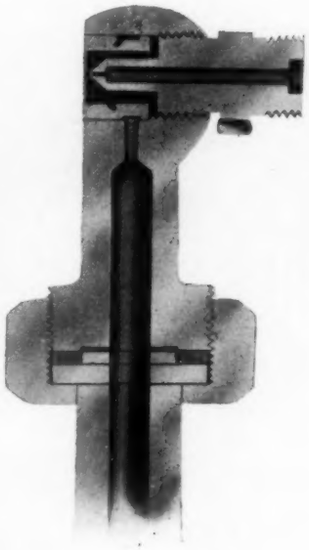

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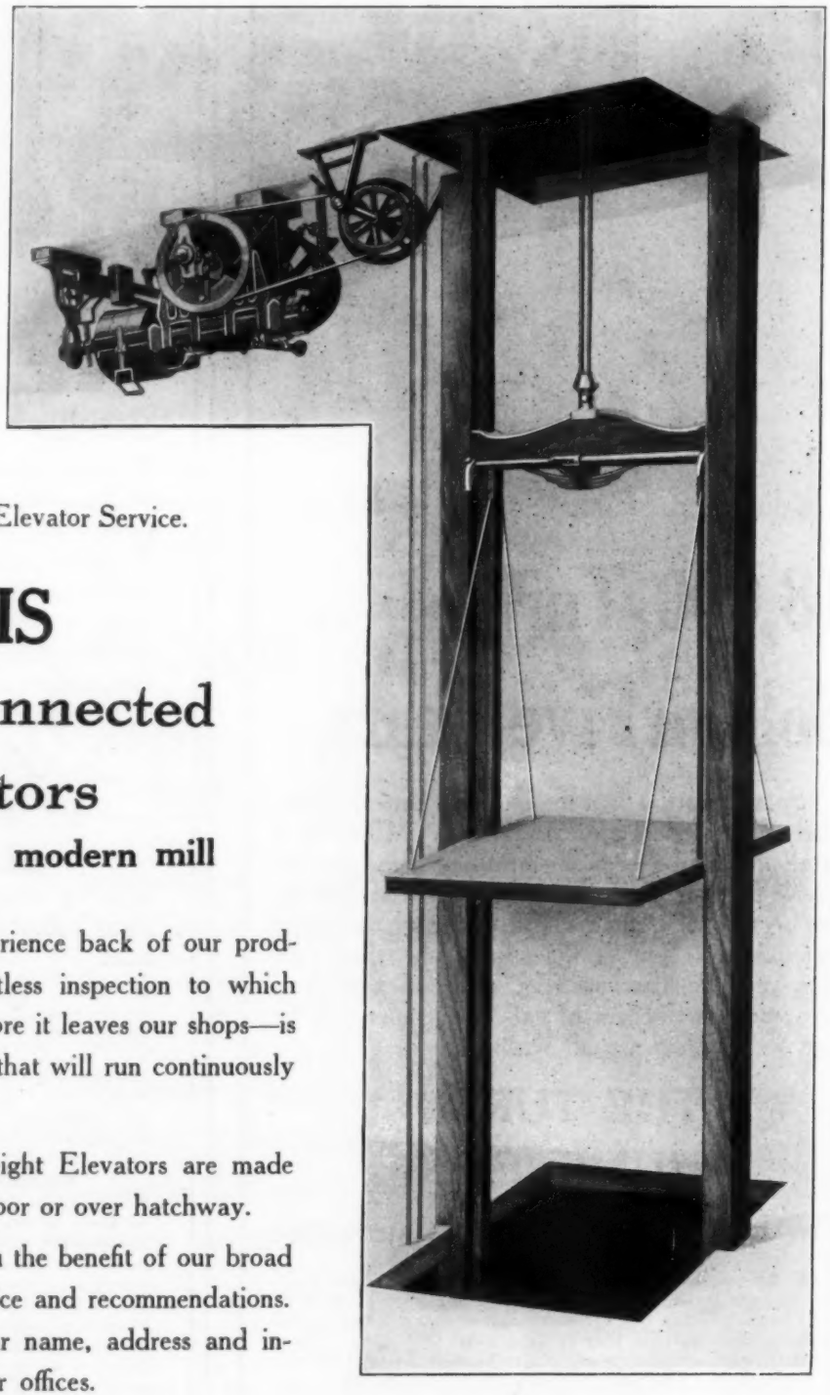

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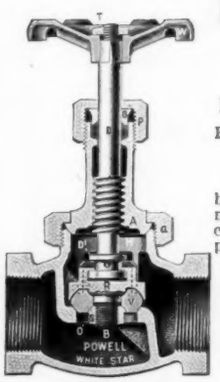

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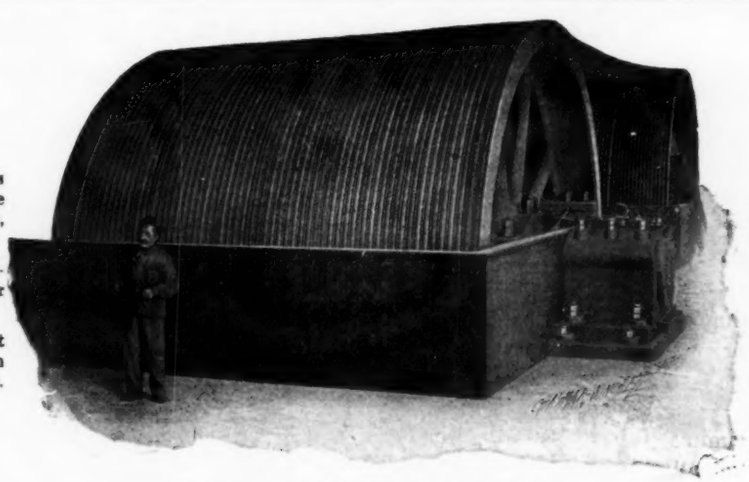

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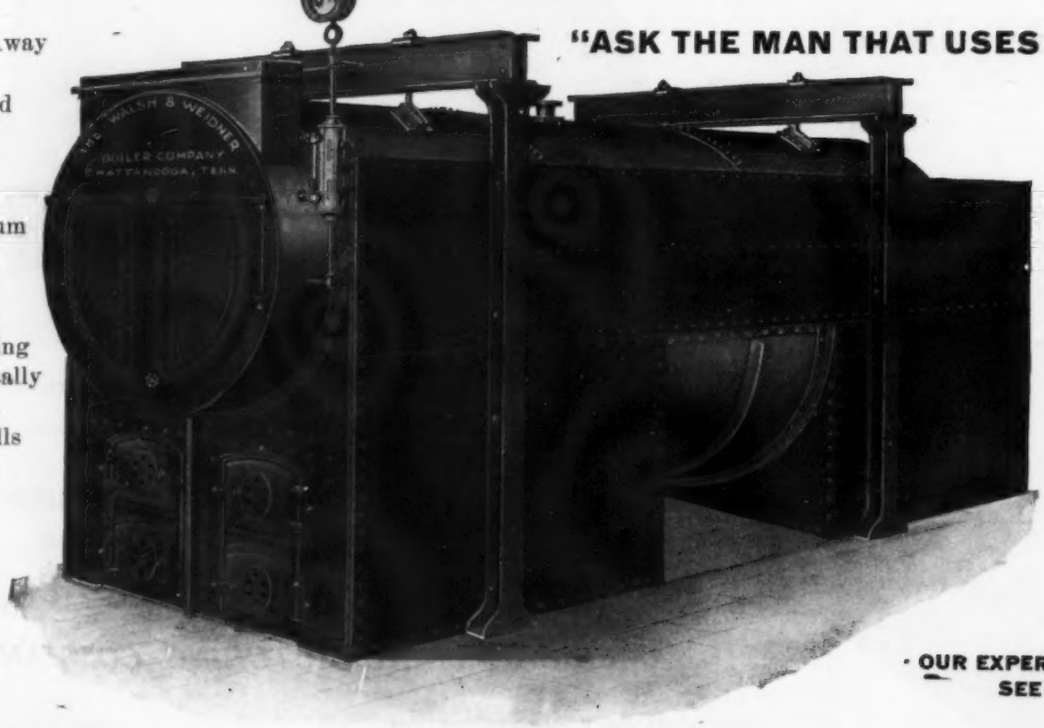

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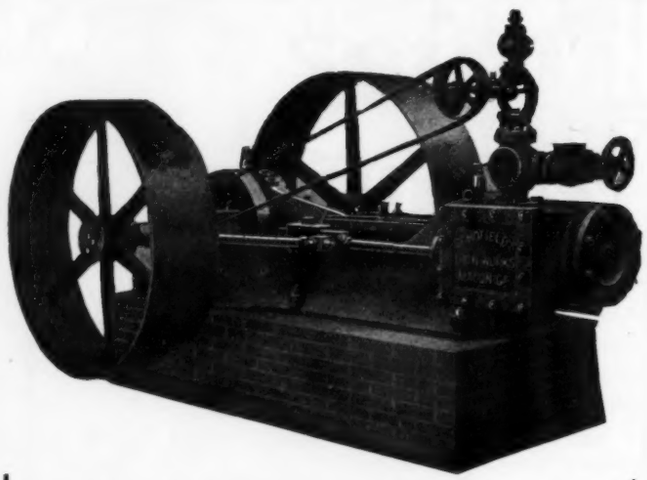

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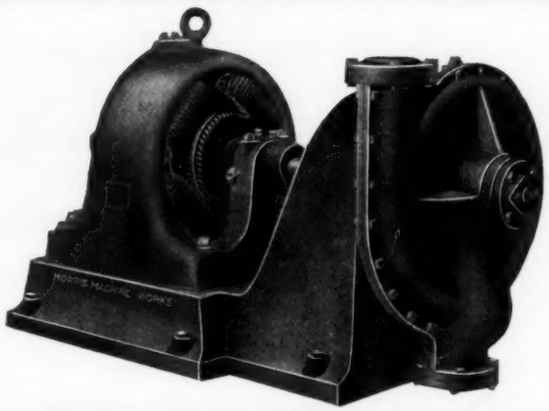

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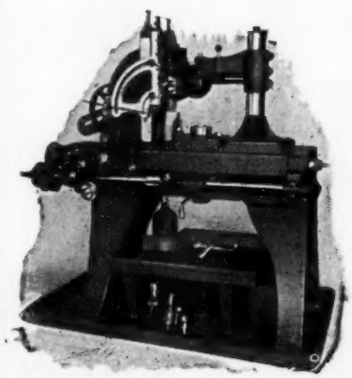

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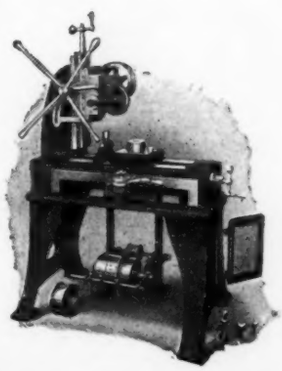

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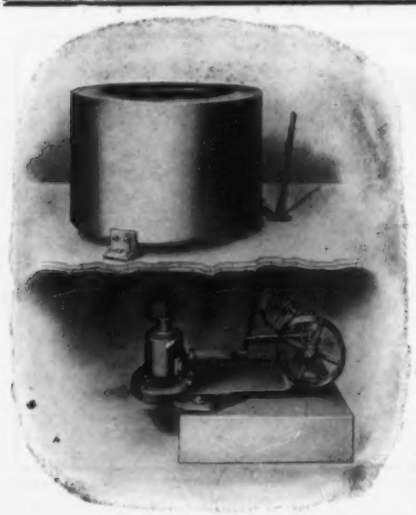

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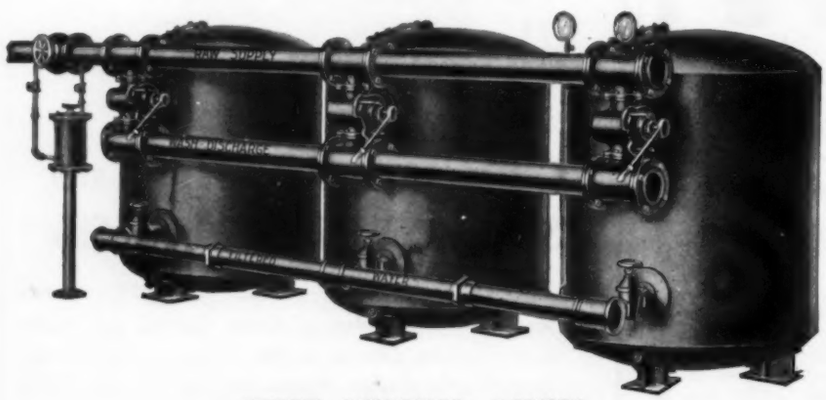

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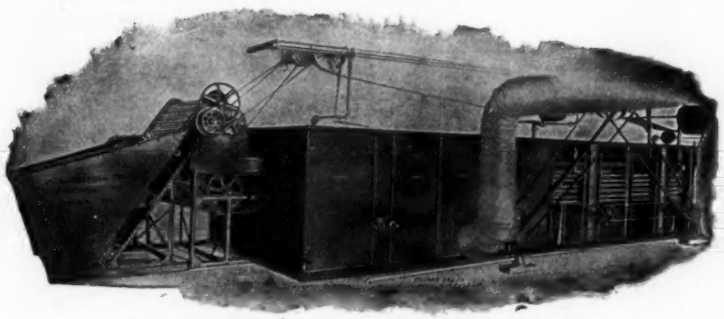

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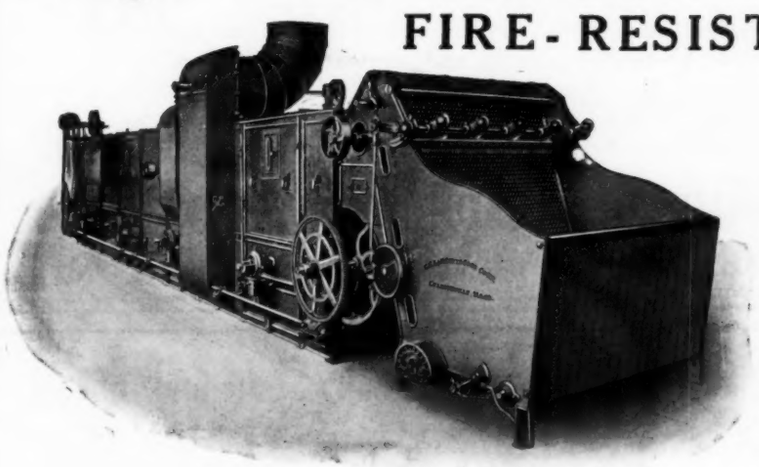

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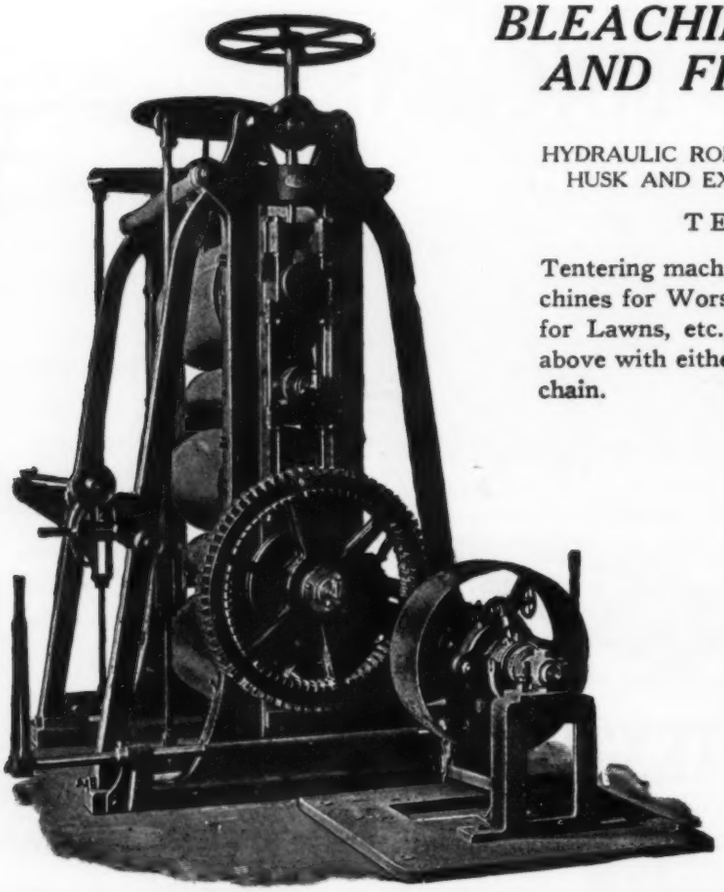

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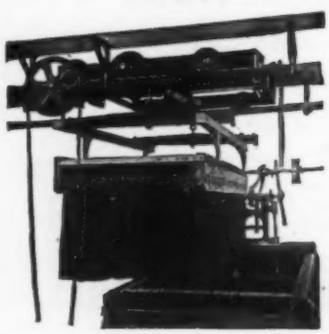

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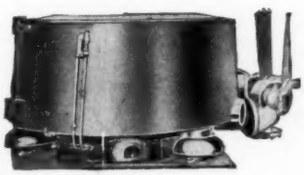

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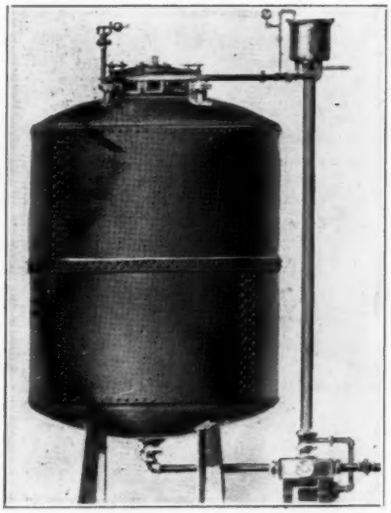

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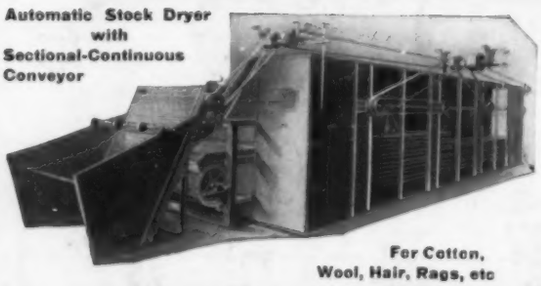

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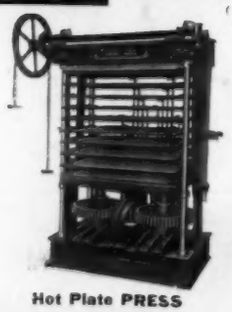

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